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ORIGINAL ARTICLES.

PNEUMATIC TOURNIQUETS: WITH ESPECIAL REFERENCE TO THEIR USE IN CRANIOTOMIES.

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SURGEONS and neurologists alike are familiar with the postoperative palsies of the extremities consequent upon the too energetic and prolonged application of an elastic tourniquet. Out of a considerable number of pressure paralyses, which have come under the writer's observation during the past two years, eight of them have thus originated. The greater number of these were of the brachial type, the tourniquet having been employed to render bloodless the field at the elbow usually for resections of the joint. A thin, flabby arm, especially in these cases of joint disease and in spite of all precautions, lends itself readily to such an injury as the poorly protected nerves are easily compressed against the hard shaft of the humerus. The skilful application of the old type of rubber tourniquet, varying it for the individual so that it exerts a compression just sufficient to shut off the arterial supply and yet not enough to harm the nerve trunks, is an art rarely acquired even by an adept hospital orderly, who may have had years of experience.

There remain other objections to its employment. One of these concerns the technic of the operation. The tourniquet usually occupies a position on the borderline of the aseptic field, and when once applied must remain so until the completion of the operation. If once relaxed, and in certain procedures, in amputations or plastic operations on aneurismal sacs for example this may be necessary in order to see whether there is a continuance of any arterial bleeding, it is most difficult to readjust the tourniquet again, should this be desirable, without dislocating all of the clean surroundings, towels, etc., at the wound. A still further drawback from an elastic band, when tightly applied, is the ensuing vasomotor palsy, evidenced by the flushing of the extremity peripheral to the site of application. In a major amputation this produces the "wet stump" oftentimes so annoying to an operator inasmuch as it necessitates drainage which otherwise might have been avoided.

Pain is another objection. In many operative procedures on the extremities, preferably carried out under local anesthesia, the temporary cessation of the local circulation is of great assistance. Patients, however, can endure the discomfort of an elastic tourniquet for a very brief period. It is furthermore a common surgical practice, and one, I think, of questionable merit, to apply an elastic ligature, when necessary to control hemorrhage, in cases of traumatic lacerations of the extremities and to wait until the "shock" from the original traumatism wears away. Such a practice, from afferent impulses of pain due to the tourniquet alone, may add not a little to the already existing vascular depression.

Thus the possibility of paralysis, the difficulties of observing the best technic during the application, removal and especially of reapplication, and the pain when no general anesthetic is administered are all familiar drawbacks to the common form of elastic tourniquet. I think they may be avoided in large measure by the use of tourniquets of another sort.

The suggestion of an inflatable tourniquet doubtless originated in the use of the distensible armlet of the Riva-Rocci blood-pressure apparatus. On one or two occasions I had utilized the apparatus itself as a means of shutting off the circulation during cocaine operations on the hand, by holding the pressure slightly above that of the registered systolic arterial pressure. Objections are self-evident. Although the pressure of the armlet is relatively painless, its slow distention by shutting off the veins before the arteries, causes such an engorgement as to render a clean dissection most difficult. Consequently a similar armlet, though broader, of less distensible rubber and of such quality that it would stand boiling, was constructed, and by connecting it with a bicycle pump of sufficient size one or two quick strokes of the piston sufficed to fill it. Such an arrangement I have made use of many times for cocaine operations on the extremities with the greatest satisfaction. The tourniquet may be adjusted but not blown up until the moment of beginning the operation, and by palpating a peripheral artery one can tell easily when a sufficient degree of inflation has been reached.* When operating on minor cases without an assistant I have used a small bicycle foot-pump, the tourniquet either being adjusted well above the operative field before "cleaning up" or, having been boiled, placed around the member within the aseptic field just before operating. In similar fashion a larger and stronger form of cylinder than those which I have had constructed would answer for use on a muscular thigh or leg.

There is a further and a therapeutic use to which this form of peripheral construction could well be put though I have had little personal experience with this particular variety of tourni-

*It would be a refinement, of course, to insert a manometer in the course of the tube connecting tourniquet and pump, and, after measuring the tension necessary to obliterate the systolic pressure, to carry the pressure in the tourniquet slightly above this point. In a large operating room this could be conveniently and accurately done by having a tank of compressed air by which the tension could be instantly carried to the required number of millimeters of mercury.

quet therapy. Many observations, chiefly by Bier in Griefswald,* have been made to show the healing effect on chronic processes such as joint tuberculosis or the effect in the production of callus and new bone formation in pseudarthroses, etc., which is brought about by the hyperemia that follows a prolonged period of venous congestion ("Biersche Stauung") artificially produced by a loosely wrapped rubber bandage. It would seem that an inflatable tourniquet would in cases of this kind be much more easily applied, less uncomfortable for the patient and much more exact, since it is desirable to accurately regulate the degree of pressure at a certain point between venous and arterial tension.

It is, however, with this form of constriction as an operative rather than as a therapeutic aid that I have had most experience during the past two years; and, above all, in exploratory craniotomies has it been chiefly put to the test.

Since Wagner performed the great service for surgery and neurology of introducing osteoplastic resections of the skull, most operators, who have had frequent occasion to explore the cranial chamber by this method, have learned the value of a tourniquet placed about the fronto-occipital circumference. The bleeding from the long curved incision through the scalp, when this precaution is not taken, is not only the source of annoying delay before it can be sufficiently controlled, but also in the effort to secure the chief vessels there is considerable risk of partially stripping away from the bone the soft parts on which it depends for its subsequent viability. Later, when the bone flap has been elevated, the weight of pendant hemostatic forceps is especially liable to bring this about.

The method commonly employed of encircling the head with a piece of strong rubber tubing in order to control the vessels of the scalp is illustrated by a cut in Kocher's Operationslehre.† An elastic band of this sort may be stripped about the head from occipital base to supraorbital region where it can be knotted or held by a powerful clamp. It requires much practice and skill to properly apply such a tourniquet, and especially in children it is difficult to keep the band in its desired position and to prevent its rolling down over the orbits. In one of my patients, furthermore, it produced a most trying postoperative pressure neuritis of both supraorbitals and one suboccipital nerve after which I permanently abandoned its use.

Owing to the present limitations of our powers of cerebral localization the majority of cases, in which the skull is opened for exploratory purposes for which a wide osteoplastic flap is suitable, possess lesions which are situated well above the level girdled by a cranial tourniquet.‡ As a matter of fact the entire surface of the hemisphere with the exception of the lower part of the frontal and temporal lobe may be exposed.

During the past year and since I have been using a tourniquet of this pattern, eighteen of my series of craniotomies have been in a situation suitable to its use. It may in general terms be said that a large area of resection is as easy (if not easier) to make and heals as rapidly as a small one. The majority of these cases, needless to say, call for an exposure of the pre- or postcentral areas and it is far more simple with a large field of the hemisphere exposed to recognize the central fissure (Rolando) or to pick out with an electrode the motor strip anterior to it than to go through the usual more or less uncertain preliminary measurements and after determining on the scalp the probable situation of an underlying area to attempt its exposure through a small opening. The latter is the common practice. With any tourniquet the chief objection to a large incision, hemorrhage, is removed. The inflatable form, however, has proved so serviceable and personally I have become so dependent upon it that I unhesitatingly recommend it or a similar device to others.

Every surgeon has, of course, his more or less individual method of meeting the difficulties of the usual cranial resections. An osteoplastic opening may be made in the skull cap in various ways, any one of which with sufficient practice may suffice for its end. The trephine, burr, saws of one sort or another, mallet and chisel, the Sudek or the Stelwagon devices, the De Vilbiss or Dahlgren forceps are but a few of them. What may serve one is awkward in the hands of another. All possess advantages and disadvantages. Personally for an osteoplastic resection I use a combined method which has proved so uniformly serviceable that I venture to describe the essential points of the technic. Others doubtless may use quite different methods and ones which are better adapted for their personal needs.

After preparing the patient's head a large square of gauze, wet with bichloride solution, is thrown well over it like a hood. Over this is slipped the tourniquet, which with its connecting tube has been boiled so that it can be handled and adjusted by the operator or assistant. It should fit the head snugly and lie flat against it (Fig. 1). In order to prevent any possible rolling of the tourniquet after inflation, should the shape of the head be poorly adapted to retaining it in place, the edge of the gauze hood may be drawn up over it, fore and aft, and pinned; or else, as I have occasionally done, a longitudinal tape may be used for this same purpose as shown in the accompanying photograph (Fig. 3). The tourniquet is sufficiently narrow (3 cm. on the flat) to lie, as stated above, well below the inferior areas of the motor zone. The tourniquet is then inflated and the shovel-shaped incision of whatever form desired made through gauze hood and scalp to the underlying bone. A momentary bleeding may ensue as the imprisoned vessels of

* August Bier, Hyperämie als Heilmittel. Leipzig, F. C. W. Vogel, 1903, p. 51, "Passive Hyperämie der Glieder durch eine Stauungsbinde."

† Vierte Auflage, 1902, p. 93.

‡ Those who choose to reflect a bone flap in operations on the Gasserian ganglion by the Hartley-Krause method, will, of course, find a tourniquet, inapplicable as it lies across the lower part of the temporal fossa.

the scalp empty themselves. It is only exceptionally necessary to clamp any bleeding points and then only on the concave side of the incision, where some of the veins may have diploetic communications. The convex side, which is the more important, remains dry.

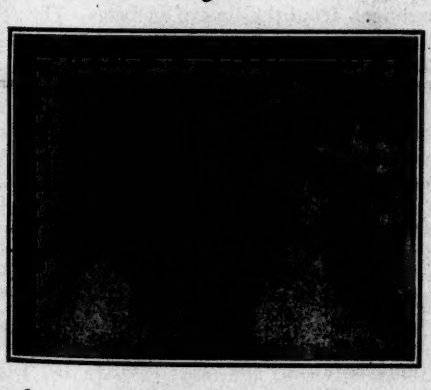
Two openings (in a very large resection three

Fig. 1.

Gauze cap with tourniquet applied before inflation.

may be necessary) are then made through the skull at the angles where the superior or longitudinal portion of the incision joins the vertical sides. A small area of the skull is exposed for this purpose by retracting away the scalp on the concave edge of the incision. The openings are made preferably with a hand trephine of bevel

Fig. 2.

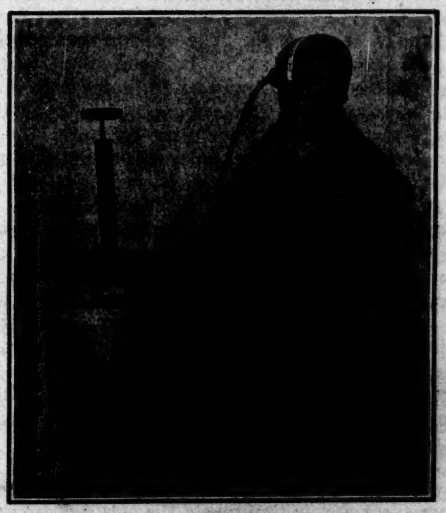


Bone flap elevated after inflation of tourniquet. Dura exposed, showing extradural clot.

pattern which has cutting ridges on the beveled surface. It is well to have the trephine of moderately large size (2 to 3 cm. in diameter) as any unusual amount of hemorrhage from the diploetic sinuses that may be encountered is better controlled through a large opening, or one which may be quickly enlarged if necessary by Rongeur forceps, than through the small perforations usually made. Occasionally in long standing cases of increased intracranial tension, from tumors, etc., the diploetic sinuses may be increased to twice their normal caliber, and owing to the existing stasis their vascular tension may be greatly raised.* A very satisfactory way of controlling bleeding from these diploetic sinuses is to fill the teeth on the bevel of the trephine with bone wax, which, by the rotary motion of the instrument, becomes squeezed into the openings and thus controls the bleeding perfectly. This has been learned from experimental work on dogs, for in these animals peculiar large and symmetrically placed diploetic vessels are normally present.†

Starting from these two trephine openings the lateral edges of the bone flap are then cut in a downward direction with forceps of the De Vil-

Fig. 3.



Showing pump, connecting tube and inflated tourniquet in position; also the longitudinal tape which prevents rolling of the tourniquet after distention in those cases in which the configuration of the head is badly adapted for holding it securely in position.

biss or Dahlgren pattern which answer the purpose well since the skull becomes thinner as one approaches the base of the flap. These linear cuts in the bone should be made parallel to but slightly inside of the lateral edge of the skin incision for reasons to be explained.

A long slightly curved blunt dissector is then passed between the two trephine openings, the dura being carefully separated from the skull as the instrument advances. Alongside this as a guide is passed the end of a Gigli wire saw and the longitudinal or superior side of the bone

* It is needless to say here that for this same reason any possible pressure on the neck from position of the head, towels, etc., which can in any way press even lightly upon the jugular vessels should, in intracranial work, be studiously avoided.

† They have been described in the Mittellungen aus den Grenzgebieten d. Med. u. Chir., Bd. IX, 1902, p. 760.

quickly sawed through on a distinct bevel, the original guide meanwhile remaining in place to protect the dura by holding it away from the wire saw. The flap is then carefully elevated and broken through at its base (Fig. 2).

This entire procedure I have carried out in young adults in seven minutes. Some skulls, especially those of the negro, may require more than double this time. Speed, however, is no criterion of the desirability of a method. Those who are accustomed to follow the changes of blood pressure during critical operative procedures are well aware that rapidity, provided it is gained by the sacrifice of blood, is the least desirable of qualities.

Nothing need be said here of the means of controlling hemorrhage during the further course of an exploration save that in cases of extirpation it is well even at the expense of time to doubly ligate with delicate silk strands, passed through the brain substance with fine curved needles, all the surface vessels of any size which radiate from the area to be removed. The incision through the cortical substance made between the double ligatures thus placed, may be quite dry and what little bleeding may come from the base of the excavation is usually perfectly controlled by a few moments gentle pressure with dry sterile absorbent cotton. Dry gauze is very destructive to raw cerebral tissue. A special technic is required to prevent bleeding from the communications with the longitudinal sinus in case the exploration must pass across the median line and more particularly if it is desired to expose the leg area of the motor cortex, for it lies almost entirely under the Lacunæ laterales of the sinus into which project the Pacchionian bodies. In man there is no more difficult part of the cortex to expose than this portion of the precentral sulcus. This is, however, "another story."

On replacing the bone flap, the importance of the oblique shelf of bone made by the Gigli saw is apparent for without this the desired amount of pressure subsequently to be put upon the dressings could not be exerted without driving in the resected island of bone. Ordinarily no ligatures whatever are placed in the scalp but the edges of the incision are approximated with painstaking accuracy. For this purpose fine interrupted black silk sutures and intestinal needles are used. In this way by an exact and snug coaptation of the edges and by the slight compression of the dressing over the line of incision thus united, against the solid underlying bone, the divided vessels of the incision may be controlled. It will be remembered that the bony part of the flap is cut concentric with but a somewhat smaller diameter than the scalp incision. The local portion of the dressing over the wound is applied before the tourniquet is allowed to collapse and is removed from the head.

Though rarely, drainage may occasionally be necessary. When so, it is inadvisable to drain directly through the incision. A better practice is to lead the strip of gauze or protective or a silver tube such as Kocher employs through a small opening made 2 or 3 cm. outside of the original incision. It is perhaps well to err on the side of drainage rather than otherwise, though in the majority of instances I find it unnecessary. Once only in a long series of cases have I regretted it for in this case the bone flap became elevated by an underlying clot and the wound had to be reopened.

In cases of exploration for cerebral tumors, provided the growth is not found or proves inaccessible, I unhesitatingly remove the bone portion of the flap extensive though it be, make no effort to close the dura over the bulging brain, and carefully unite the scalp as described above. It is in these palliative operations that the importance of an accurate approximation is most evident since with early and perfect healing a large hernia may develop without separating the skin incision. By taking these precautions I have never yet seen the lamentable sequence of a fungus cerebri develop. In one case only in my series has this occurred, and it might have been avoided had I at the time had a wider experience. The case was one in which I successfully extirpated a solitary tubercle of the cerebellum, but instead of closing the wound or of draining over the edge of bone from the outside of my original incision, I drained directly into the cavity left by the extirpation through the latter. In the course of a few days a hernia developed with a fungus cerebri, which protruded through the opening where the drain had been inserted, and in spite of all precautions infection ultimately led to the death of the patient some three months after the operation.

It is customary to make the first dressing in the ordinary run of cases on the second day after the operation, at which time the fine sutures are all removed from the line of incision. The delicate scar receives its subsequent support by placing over it long strips of gauze saturated in collodion. No further dressings are necessary, and this hard protective covering is then left untouched for two weeks or more. No cases, when handled properly, are technically so simple, nor have such an uneventful convalescence as these very cases of exploratory craniotomy—for unlike similar abdominal explorations a period of recumbency after the operation is not essential.

Not the least factor in simplifying the procedure is the use of the inflatable tourniquet, and the belief that such an apparatus has heretofore not been used is the chief reason for making this communication.

The Etiological Relation Between Trauma and Tabes.—In the strictest sense, according to A. SCHITTENHELM (Deut. Zeitsch. f. Nervenheilk., Nov. 10, 1903) there is no such condition as traumatic tabes, but rather in all those cases in which tabes follows a traumatism, the latter is to be regarded as an accessory or exciting cause, leading to a predisposition, or in the presence of an actual predisposition to tabes, tending to enkindle it or serving to unmask a latent tabes and to accelerate its progress.

A CASE OF STRANGULATED INGUINAL HERNIA: DEATH FROM FECAL DROWNING DURING ETHERIZATION.

BY EDWARD H. GOODMAN, M.D.,
OF PHILADELPHIA.

PATIENT was a white male, sixty-five years old and was admitted to the men's surgical ward of the Presbyterian Hospital during the service of Dr. Henry R. Wharton, with the following history:

Patient had been suffering with a large inguinal (scrotal) hernia for a number of years, but had received no treatment for the condition, apart from wearing a truss at rare intervals, and then for a short time only. Lately the hernia had grown larger, but not until two days ago had it given him any inconvenience apart from that caused by the size. Two days ago (June 10, 1903) he began to feel some discomfort in the inguinal region, was nauseated and vomited at intervals. His family were unable to state whether the vomitus was fecal in character, but said it was a "dark-looking fluid." Constipation was not absolute at first but became so rapidly, and his general symptoms became so severe that he was removed to the hospital. While in the ward his vomiting was stercoraceous. The scrotum was distended enormously, being as large as, if not larger than, a football, and the penis was almost invisible, save for a slight wrinkling of the skin indicating the prepuce. He was admitted to the hospital 12:45 P.M., June 12, 1903. The condition was diagnosed as strangulated inguinal hernia, and the patient was prepared for immediate operation. On admission his temperature was 97° F., pulse 108, and respirations 24.

Before ether was administered, examination of the patient showed him to be in poor condition; his pulse was 100 per minute, not strong and rather irregular and his respirations were 36. Face was somewhat cyanosed, lips blue, and an anxious expression about the eyes. The capillaries of the face were markedly dilated. He was normal so far as murmurs were concerned; lungs somewhat emphysematous.

Ether was administered (slowly) on Allis' inhaler and for about three or four minutes, patient took the anesthetic well. Color remained about the same, there was no attempt at vomiting, no struggling, and the pulse, while of fair volume and strength, became more rapid. After about five minutes from the time the anesthetic was commenced the patient became more cyanosed and asked to be allowed to sit up, which request was granted. Consciousness had not been affected by the ether up to this point, pupillary reflexes were present, and rigidity and voluntary movements still remained.

Patient's condition became worse, and oxygen was administered; pulse became weaker and more rapid, and patient's face was a deep blue. The head was lowered and artificial respiration was resorted to. At the first pressure on the chest, fecal matter poured from the mouth and nose and continued to do so as long as artificial respiration was practised. Tracheotomy was performed, and the fecal matter poured from the larynx filling the tracheotomy tube.

The heart was audible for about ten minutes after the patient's condition became critical and artificial respiration was continued for about twenty-five minutes or from five to ten minutes after the heart became inaudible to the ear applied to the chest wall. The patient was pronounced dead and all efforts to resuscitate him were discontinued thirty minutes from the time the anesthetic was begun. Total amount of ether used was between an ounce and one and a half ounces.

Patient had had several attacks of vomiting in the morning just prior to being sent to the operating room, but at no time since he came under the writer's observation had there been any attempt at emesis, and not until artificial respirations had been instituted did fecal matter become visible.

No post-mortem examination was made and it is presumable, and indeed almost certain, that during etherization reversed peristalsis had occurred, the fecal matter had poured into the trachea, then into the lungs and the patient had literally drowned in his own excrement.

This case has points of resemblance in common with the interesting cases reported lately by Dr. Andrews, of Chicago. There is no doubt in my mind but that the ether had benumbed the sensibility of the throat, and the acrid fecal matter had not excited any attempts at expulsion by vomiting, but had poured from the pharynx into the trachea in a rapid and uncontrollable lethal torrent. The fearful suddenness with which this death-dealing Niagara acts, makes it impossible to hope for effect from any treatment, as is shown by a study of this and Dr. Andrews' cases.

The suggestion of Dr. Andrews concerning the use of local anesthesia in intestinal obstruction operations is a good one, and cannot fail of appreciation by those who have been so unfortunate as to have been eye-witnesses to a case such as the above.

Dr. Andrews in his summary remarks that "we have no evidence that it (flooding of the air passages by fecal vomit) can occur during consciousness even *in extremis*."

The case just reported presents this noteworthy peculiarity, that the patient was apparently fully conscious and was able to articulate intelligibly and intelligently, but yet gave no sign of impending death from fecal drowning.

The Destruction of Sugar in the Organism.—That all the tissues of the body have the power of splitting up the sugar-molecule was discovered by J. ARNHEIM and A. ROSENBAUM (Hoppe-Seyler's Zeitsch., Dec. 19, 1903). This power varies with the different tissues, and is greatest when the tissue of the pancreas is combined with another tissue. The means by which this process of glycolysis is brought about is not yet known.

A HISTORY OF SALIVA, ITS PHYSIOLOGY, CHEMISTRY AND PATHOLOGY.*

BY HAROLD M. HAYS, A.B.,
OF NEW YORK.

THE action of saliva in health and disease is not a new subject. During all ages it has been more or less the object of contemplation and research, not because its study was more enticing than many others but because of the probability that its secretion was vital and necessary to the maintenance and welfare of the body.

At the time of Hippocrates, little was known about physiology. We read in his writings that the glands were spongy viscera, destined to secrete humidity to the surrounding parts.[1] But as the physicians of that time were given up to the speculations of transcendental philosophy and its application to life, there were various theories as to the source of the secretion of the saliva and its action. By many of the old philosophers and physicians, the salivary fluid was supposed to be excrementitious in its nature and the terms saliva and sputum were used synonymously. It was natural for them to suppose that the saliva had no other function.[2]

The contents of the saliva at that time, and for a great many years for that matter, were never determined by chemical means. As all glands were "destined to secrete humidity," the salivary glands followed the rule of all the others. However, it must be admitted that physical and speculative characteristics were given to it. It was thought to be composed solely of water with a little salt and spirit. Variations from these three proximal ingredients were given by many, as Koeperus, Neuter, Hoffman, Viridetus, Lentelus, et al. The speculative notions entertained by many of the older authors concerning the impregnation of saliva by animal spirits seemed to be due to the occasional occurrence in it of carbonic acid and atmospheric air which appeared to make it bubble and froth. The discordant opinions concerning its further composition were either the result of idle speculation or of the examination of the fluid having been made both in its morbid as well as in its healthy condition.[3]

The association of physiology, pathology and therapeutics, in ancient and medieval times was little known. Although saliva, as a physiological entity was of little consequence, the fluid (as in many parts of the world until recent times), was used as a therapeutic agent. There is little doubt, however, that whatever therapeutic value it had was in the efficacy of its arousing faith as to its healing properties.

As an external application, saliva has been universally in great repute for affections of the eyes. When Vespasian visited Alexandria, an inhabitant of the city besought him to spit upon his eyes for the restoration of his sight. We are told that the remedy was successful. In various affections of the eyelids, it was recommended by Vereduccius.[4] To remove the pits of smallpox, its employment had been suggested by Doloeus.[5] To heal ulcers and cure warts, it had been recommended by Nuck. And, lastly, it had often been advised to add saliva to ointments to facilitate their absorption, for what purpose we know not.

As a bland and soothing agent, saliva has always been used. It seems to be the natural prevocative of man and animals to use it for emollient purposes. For example where the mucous membrane of the lips has become excoriated, it appears to have a soothing effect. In cuts, in the sting of bees, in the bites of poisonous insects or reptiles, saliva has often been applied to the injured part and has mitigated the intensity of the pain and soreness.*

One interesting incident in the supposed therapy of ancient times, has been handed down to us. In the old Grecian arena, at the Olympian games, etc., the saliva was often used to strengthen the fists of the pugilists. Either the man himself spat into his own hands or saliva was rubbed into them. It was thought at that time that there was a stimulating action of the saliva exercised over the part treated, and so the hands would become more limber and more impervious to injury. This ancient custom still exists among the fist-fighters of to-day. The young ruffian on the street corner who is about to enter into combat, considers it a natural thing to spit into his hands and "limber them up" before he enters into battle. It is but a good example of the process of evolution and the transmission of unconscious acts by heredity.

A true function of the value of saliva was not thought of up through the middle of the Dark Ages. Even Galen gave no anatomical description of the glands. He maintained that the saliva was transmitted to the mouth by particular *veins*. The idea was never suggested to him to attribute to these organs the special function of preparing a useful fluid. In fact, he considered the salivary glands as receptacles for an excrementitious humor of the emunctory vessels. The preparation of a fluid in these glands, was perhaps thought to be a secondary affair in the function of the gland.[1]

After the time of Galen, the same ideas held forth until the middle of the eighteenth century. Chemistry was then beginning to come to the foreground and many men spent much thought and time on the examination of the saliva as to its chemical constituents, its variations in health and disease and lastly as to its physiological importance. It was known, for example, as early as 1788, that if saliva be heated, it not uncommonly acquires an acidity in a few moments.[6] Berzelius, a Swedish chemist (1790), first discovered and described ptyalin, which at that time was not known as a specific enzyme and was never isolated, being considered as a portion of the albuminous product of the saliva. Trivaranus (Biologie

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* It has often been noted in laboratory experiments on dogs that the saliva which the dogs lick on their wounds often acts as a gelatinous covering, thus protecting the wound almost as well as if collodion had been put on. This fact will often obviate the necessity of putting on any bandage at all, especially if the wound is small.

565) first observed the blood-red color saliva acquires on the addition of a persalt of iron. He believed it to be produced by a constituent denominated by Winterl, "acide du sang" and which Porret afterward proved to be hydrosulphocyanic acid. The observations of Porret were subsequently confirmed by Gmelin and later by Ure. It was found that sulpho-cyanogen occurred in human saliva, in sheep, in some dogs and horses, chemically combined with potassium. The proportion varied, being augmented by local conditions, stimulation of the salivary glands, as in smoking, chewing, etc. It was also supposed to be increased by the internal use of prussic acid, salts of cyanogen and remarkably so by the use of sulphur.[8] It was discovered by Leuchs, about 1828, that saliva has the property of converting starch into sugar. After this, many experiments were made to substantiate the doctrines already brought forth and to observe the action of saliva on the stomach. Spallanzini and Reamur introduced food, previously deposited in perforated tubes into the stomachs of different animals; they found that when the food was moistened with saliva, it digested more quickly than when moistened with pure water.[7]

We thus see that with the steady advance of science up to the year 1842, the saliva was beginning to be appreciated as a separate and individual part of the human organism. Experiments were done to justify its digestive powers; its reaction was ascertained in various ways; its influence and its chemical constituents in disease, were tested and so its study grew steadily.

To sum up the main things that were thought about saliva in 1841, I shall quote the conclusions of Dr. Wright, published in the *Lancet* of that year: (1) Saliva has the power of modifying, and, to a certain extent, of digesting vegetable and animal substances. (2) It has a more powerful action on the vegetable than on the animal matter. (3) The healthy digestive action of saliva is always attended with the evolution of lactic acid. (4) Filtration or boiling, diminishes the digestive powers of the saliva but does not destroy them. (5) Exposure of the saliva to atmospheric air, for a moderate length of time, does not materially weaken its digestive powers; but they are enfeebled in the ratio of the putrescence of the fluid. (6) Oxygen gas assists the digestive action of the secretion, but is not essential to it. Carbonic acid gas impairs this action in a mild degree, and hydrogen and nitrogen gases weaken it very considerably. (7) *Acids and alkalis, added to saliva, diminish or destroy its digestive properties.* (8) The presence of saliva in the stomach is essential to healthy digestion. (9) The digestive action of saliva is not possessed in any efficient degree by animal mucus, acid, alkali or alkaline salts.

Physiology.—As in all secretions of the body, the experiments have been made both upon man and animals. The general tendency has been, not to find any new substances, but to study the variations in constituents and the variation in action of these constituents during the physiological life. Thus, for example, saliva has been studied under the action of alcohol, ether and other substances.[9] Again, the quantitative variations in alkalinity and digestive power have been studied.[9]

The real action may be divided into three classes: (1) Its action in mastication; (2) its action in deglutition; (3) its action in digestion.

The masticatory action of saliva is a simple physical process and probably was observed hundreds of years ago. The food seems to be lubricated, as it were, and thus is formed into boli, which can the more easily be chewed. A proof that the saliva is important in mastication is observed from the fact that saliva is more copious in those creatures whose food requires continued mastication. "In ruminating animals, accordingly, the salivary glands are numerous and of great size, while at the same time they are so situated that the play of the muscles in the act of rumination communicates to them a proportionate stimulus. In those again who do not masticate, but swallow their food entire, there is scarcely any salivary secretion, and the glands appropriated to it are very small."[10]

The deglutition action also is more or less physical and is designed to act upon those foodstuffs which in themselves contain little free water, to act as a lubricant. Thus, for example, it is found that an ordinary cracker can be swallowed with difficulty unless there is sufficient admixture of saliva to allow it to glide along the walls of the esophagus.

Naturally, it is now admitted that the principal action of saliva is its aid in digestion. But as late as 1840, the only way this was known was by the fact that when saliva was absent, there was a marked deterioration in nutrition and digestion. "Though I have been unable, from experimental inquiry, to discover in saliva any physiological activity, yet I have observed that its alteration or its absence is invariably characteristic of a depraved condition of the saliva; and, as I shall hereafter endeavor to prove, the various morbid states of this fluid being representative of disease in the system or in its secretion, the examination of the ptyalin may be advantageously suggested as an addition to our other means of diagnosis"[9] (Wright).

The digestive action of the saliva may be considered as (1) that in the buccal cavity, and (2) that in the stomach.

The action of saliva on starch was first discovered by Leuchs and afterward verified by Schwann. Leuchs digested in some acidulated saliva for twenty-four hours a certain quantity of boiled starch, then filtered the fluid, and found that iodine produced in it no change of color. Having neutralized it and evaporated it to dryness, he obtained from the residue, by means of alcohol, a considerable quantity of sugar which he recognized by its taste as well as by its property of fermenting yeast. The part of the residue which the alcohol did not take up, consisted of the salivary matter of the saliva, in part altered in

its properties, and of starch changed to a substance resembling gum, which with the iodine did not strike the blue color which characterizes starch.[7]

The action of saliva upon starchy products has been studied up to the present day. The principal action seems to be in changing the polysaccharide to a more soluble form as follows:

Starch
|
Soluble starch
/ ——maltose
Erythrodextrin
/ ——maltose
Achroodextrin
/ ——maltose
a. achroodextrin
b. achroodextrin.

But the amylolytic power of saliva is not constant. There are decided changes according to the time of day it is secreted, the character of the food eaten, whether disease is present or whether the patient is possessed of emotional disturbance as will be cited later on. Hofbrauer shows that there is a distinct fluctuation at various periods of the day. For example, the amylolytic power is greater before breakfast than after the morning meal.[11] This is confirmed by the observations of Chittenden and Richards.[9] "It would appear that saliva secreted after a period of glandular inactivity, as before breakfast, is ordinarily possessed of greater amylolytic power than the secretion obtained after eating. Before and after dinner, however, the difference in amylolytic power is less pronounced, a fact which might be expected of the short period of recuperation between the breakfast and dinner and because of the more or less constant stimulation of the salivary glands during the waking hours." These changes in digestive power seem to be due primarily to a greater intensity of the enzyme ptyalin.

The action of saliva is not especially manifest on forms of food other than starch but there is no doubt that other kinds of food alter its secretion and intensity. In this connection may be mentioned the intake of great quantities of food of any kind which need mastication, and the eating and drinking of stimulating articles of diet, such as pepper, salt, alcohol, gin, whisky, etc. All of these substances change the character of the saliva in alkalinity, amylolytic power and amount of solid matter.*

The action of saliva in the stomach is practically a minor one. That which is not combined with the starch enters the stomach in its own form and exercises its action principally by its alkalinity. At first it helps to neutralize some of the hydrochloric acid at meal time; and in the intervals, it acts as a stimulant to the mucous membrane of the stomach, the same as any alkaline substance will. There is no doubt, however, that there is a distinct relation between the secretion of saliva and the gastric digestion, probably due to some influence of the nervous mechanism because of the intimate relations between the two secretory centers in the medulla. "From a number of cases we see that a debilitated or depraved function of the stomach is apt to be associated with a defective action of the salivary glands."[8]

Among some observers, the quantity of alkalinity which the saliva gives to the gastric juice is of great consequence, probably because of the stimulation of the gastric cells. "The habit of smoking after a full meal is capable of excellent physiological significance. If a person spits much (as in smoking a pipe) the acidity of the stomach has not as great a chance to become neutralized. The alkaline saliva is wasted instead of serving a useful purpose. And, conversely, if a man sit down to a good cigar or pipe after dinner and swallow the saliva which the tobacco occasions, the stomach will find itself aided in its digestion and an equilibrium of digestion will be established. So, also, the indigestion consequent upon sleeping after dinner, or after a hearty supper, is chiefly owing to a diminished or suspended secretion of the saliva." *Cum grano salis!*

There is no doubt that there are baneful influences from too frequent or abundant spitting, partly due to the change in the stomach. Dyspepsia and all its concomitants are often the result. Dr. Wright says that he once spat 250 drams of saliva in one week, often having to spit right after dinner. In seven days, he lost eleven pounds and was much weakened and emaciated.[8] When any secretions are thus abnormally taken from the body, the like result follows.

As the ingestion of too little saliva into the stomach seems to have a deteriorating effect, so the swallowing of too great an amount will be a source of discomfort and uneasiness and cause a change in the gastric digestion. Too little saliva causes a bad effect *during* and *right after* meals; too great an amount exercises its effects *between* meals. In people who are habitually large eaters, the salivary secretion is generally very abundant. This is also observable in children and in healthy young adults. Such subjects are usually intolerant of hunger, and when fasting longer than common, are apt to suffer severely from nausea, flatulence and pain in the stomach. "An increased flow of saliva occurs always in long fasting, perhaps due to psychical or reflex influences. The desire for food being urgent, the salivary fluid is correspondingly increased, and of course the fluid is generally swallowed for want of something better. This at length becomes a source of uneasiness; some pain may be felt; there are flatulence, nausea and eructations. If food be not taken, the saliva is discharged in the clear limpid state in which it was swallowed. In such cases the appetite is often not fully restored except by the repose of the patient or by a stimulant. They are said to fast until they are sick." We seldom see this action in invalids where the secretions are not so active, nor do we find this in people who never have a strong sensation of hunger. Perhaps, if a person is going to take a walk

* An excellent table to illustrate this point may be found in the American Journal of Physiology, Vol. 1, page 475.

before breakfast, a little crust of bread will ward off the feeling of discomfort, because enough secretion is given to the stomach, whereas in fasting the saliva is often diminished. If we are to act on this same principle, we may thus account for the beneficial effects of smoking or chewing tobacco or the chewing of gum in allaying nausea and hunger.

The action of the nervous system upon the salivary secretion is most profound. But one is not prone to regard this in physiological states of the system. There seems to be no doubt that all the secretions of the body are more or less reflexly or directly governed by terminal end fibers in secretory cells. For example, in anxiety, in a fit of anger, in profound grief, in derangements of the nervous system in such diseases as locomotor ataxia and brain tumors, the secretions of the body are inhibited or augmented. The salivary secretion follows the general rule. A reflex augmentation may be incited by the sight or smell of food; a diminution may be brought about by fear or a cachetic state. By experiment, also, it has been shown that saliva exerts a marked influence *upon* the nervous system. It has been found in the injection of saliva into the arteries or veins of an animal, that spasms, convulsions and coma will often result. One might think that the direct cause of this was the same action as any foreign body would exert. But it was found that if other fluids were injected, no such results followed. This proves that the action of saliva on the central nervous system is one solely due to some inherent power of its own.

"The salivary secretion is immediately influenced by the operation of the mind; the sight of a delicious repast to a hungry man is not more effectual in promoting it, than is the operation of fear and anxiety in repressing it. Whence we are told to believe that the Hindoo ordeal by rice may have occasionally assisted in the ends of justice. This ordeal was conducted in the following manner: The persons suspected of any crime, being assembled in a ring, a certain portion of dried rice was given to each, which they were directed to chew for some moments, and then to turn it out of their mouths on the leaves or bark of a tree. Those who were capable of returning it in a bulky form were at once acquitted, while those from whose mouths it came out dry were pronounced guilty."

A medical man tells of a patient who was of a very nervous irritable temperament, who had the idea that she was the subject of enlarged liver; and, because of this, requested that she be given mercurial inunction in order to become salivated. As she could not take internal preparations, because of a disordered digestion, she was given a little common lard, darkened with charcoal, with which she very conscientiously anointed herself every night for about a week. At the end of that time she was as profusely salivated as if mercury had been given.*

Other examples of the action of the central nervous system on saliva are unnecessary. The purpose of this brief résumé, is but to recall the fact that the secretion of saliva is certainly a complex affair.

Physiological Chemistry.—The ordinary qualitative analysis of saliva may be found in any text-book. In simple terms it may be expressed thus:

Water 99.5 per cent.	Solids 0.5 per cent.
Organic.	Inorganic.
Mucin	Salts of Na, K, Mg, Ca.
Serum albumin	KSCn
Serum globulin	Traces of SO_4, etc.
Cells.	
Bacteria	
Spores	
Food débris.	

The quantitative composition certainly varies with individual observers and in individual subjects, according to the time of day the saliva is taken, the amount secreted, the food eaten, etc. The average amount calculated by Bidder and Schmidt is 1,500 grms.[8] for the twenty-four hours. The quantity of secretion may be equal in one hour to eight to fourteen times the weight of the glands, "and there is probably no gland in the entire body, as far as we know at present—the kidneys not excepted—whose ability of secretion under physiological conditions equals that of the salivary glands."[14] *

As was seen before, the amount of the saliva may be directly proportionate to its solid constituents or not. Saliva is always denser after a meal than during fasting and the old impression used to be that it was denser in the evening than in the earlier part of the day. This has been ably disproved by Chittenden and Richards.[9]

Aside from all this, the principal things of interest are the amylolytic power and the alkalinity of the saliva and whether the amylolytic power is increased or diminished in changes in alkalinity. We have already discussed the amylolytic power. Let us turn to its reaction.

Saliva is now known to be alkaline in reaction but it was not always thought to be so. Hoffman, years ago, thought it to be acid.[15] So also thought Viridetus, Lentilius, Heinsius and Dionysius. Others found it to be acid after fasting a certain length of time. The saliva of dogs is generally alkaline; oftentimes that of sheep and pigs is acid; but monkeys in confinement are more subject to it than other animals.[8]

It has several times been observed in dogs that the salivary secretion, which was previously strongly alkaline, became feebly alkaline, or neutral *post coitum*. The saliva of man and animals is generally increased in alkalinity by abstaining from sexual indulgence and conversely.[8]

The relation of amylolytic powers to alkalinity is even now a subject of numerous investigations. According to Hammarsten, its action is greatest when neutral.[16] According to Chittenden and

* A number of similar actions of the mind are well illustrated in Hack Tuke's "Influence of the Mind over the Body."

* A comparative table of quantitative estimation of the saliva is well seen in Hammarsten's "Physiological Chemistry."

Smith, it is most active when feebly acid.[16] "Experiments on the diastatic action of the saliva under various conditions have recalled the fact that human mixed saliva in the presence of an equal volume of gastric juice, containing 0.5 per cent. hydrochloric acid, is capable of forming from a given quantity of starch a much larger amount of sugar than the same quantity of it alone can produce under a like degree of dilution, this being the more remarkable when it is remembered that the same percentage of acid itself greatly retards the diastatic action."[8] From a number of experiments by Chittenden and Richards, it is seen that the variations in amylolytic power are not dependent upon the amount of alkaline salts; but that, more likely, the alkaline salts are increased when there is a greater degree of amylolysis, showing a higher degree of concentration of the enzyme.

But the alkalinity varies at different periods of the day, under different conditions and with different individuals. It has been found to be fairly constant for a given period of the day in the same individual.[9] However, the variation in alkalinity is very slight, in any event. It is greater in the saliva after a night's rest. Before and after dinner, there is little difference.[9] It would seem from this that there was a constant equation between the alkalinity and the amylolysis, for they both seem to vary at the same time. Yet the reaction, probably is due more to the concentration of the fluid at these times, than anything else.

Pathology.—The physiology of saliva has received far more attention than its pathology. And rightly so. For in the various diseases of the human individual, where pathological states of the saliva have existed, there have been far better indications of the disease in the urine, in the facies of the patient and in other symptoms. Yet to the experimental pathologist and chemist, pathological states of the saliva have their interest; for it may be that there is an altered state in certain latent diseases where no other indication of the disease may be found In certain cases of jaundice for example, the saliva is colored; but so is the skin, the conjunctivæ, etc., so that diagnosis from this source is not needed. In a case of ascites reported, urea was found in the saliva, but urea was also found in the sweat and in the ascitic fluid when this was withdrawn; so this did not aid in diagnosis. So, in other diseases, foreign substances are found constituting a part of a general diathesis. However, there are some diseases where the quantity of the saliva and its quality are changed, as in the ptyalism of mercurial poisoning. And again, one can hardly think that if serious experimental research is adopted to determine the variations of the saliva in a number of cases, we shall not be able to diagnosticate several important diseases. Hoffman stated years ago that "the state and kind of most diseases can more readily be learnt from an inspection of the saliva than from an examination of the blood or urine." So believed Pausa, Poterus and Baglivi. Of course, in the light of our present knowledge concerning the value of the examination of the blood or urine, this is a little far-fetched but it indicates the point. "An intimate acquaintance with the pathology of saliva is an important item in the recognition or relief of disease; and, as will be anticipated, a restoration of the secretion to the normal state of purity, is a most efficient means of contributing to the healthiness and activity of the other functions which are necessary to the sustenance of animal life."[8]

Various pathological states of the salivary secretion have long been known to exist. *Deficiency* of the secretion is often associated with a debilitated or depraved function of the stomach and in wasting fevers; it may also be associated with obstruction to some of the salivary glands by calculi. As we have stated before, it may be secondary to an inhibitory action caused by grief, passion, fear or anxiety. *Excited* or *increased* salivation may be caused by a hyperacidity or superacidity of the gastric juice. This variation is often seen in cases of hypochondriacal and melancholic patients. Hoffman speaks of the abundant salivation of these patients.[17] M. Rayer relates the case of a hypochondrical female, twenty-four years old, who for many years was attacked at intervals of thirty, forty or fifty days, with a profuse salivation which lasted from thirty-six to forty-eight hours. The quantity of saliva discharged in twenty-four hours amounted to several pints.[18] Of the excited salivation of mercurial poisoning, we have already spoken.

Fatty saliva is often associated with a fat necrosis due to some obstruction to the circulation. *Sweet* saliva is an accompaniment of diabetes mellitus. *Albuminous* saliva is exceedingly uncommon. Dr. Cranston Chrales mentions that in a young man he found, just as Seminola had done, some albumin in the perspiration and saliva as well as in the urine.[19] *Bilious* saliva is found in severe cases of jaundice due to cholecystitis, cholelithiasis, or carcinoma of the head of the pancreas—in fact in any disease where jaundice is found elsewhere. Oftentimes the saliva is not colored, but on chemical examination is found to contain bile salts and bile acids. *Bloody* saliva is of no consequence, as it is usually due to hemorrhage in the nasopharynx or from an ulcer of the stomach where the other symptoms are of much more importance. The only point is to differentiate it from a hemoptysis.

Uric acid may be found in the saliva or a uric acid diathesis may alter the saliva. "When uric acid headache is present and the urine is scanty, the mouth also tends to become dry or sticky and the saliva is scanty; and when the headache has been cured by acids, opium, iodides or any of the drugs which clear uric acid out of the blood—not only is there a diuresis but the saliva also becomes relatively profuse."[20]

In a case of ascites, reported in the *Lancet* of 1841, urea was detected in the saliva. I shall quote the case at length, as it tends to demonstrate the excretory equilibrium which the body maintains.

Female, thirty-nine years old, regular and temperate in habits. Large abdomen; pain in kidneys; passed water without difficulty but the quantity seldom exceeded two to three ounces in twenty-four hours; secretion was pale and nearly colorless, but without a trace of albumin; spec. grav., 1.026; tongue furred; saliva acid; bowels constipated; appetite capricious. On tapping, three gallons of fluid were removed from the abdomen. About three weeks later, there was pain in the cheeks and profuse salivation. The saliva discharged was of a pale chocolate color, slightly ammoniacal in odor, strongly alkaline in reaction and, according to the patient, very disagreeable in taste. The quantity discharged in the first twelve hours amounted to 14½ ounces. A pint and a half of this was examined and was found to contain ten grains of urea. The next day the saliva amounted to twenty-three ounces and the next day to twenty-five. Then the amount gradually decreased down to the time of death. The kidneys were increasing in activity every day. "To the deposit of urea in the abdominal cavity in one instance and the discharge by the salivary glands in another, may be referred the patient's freedom from cerebral disturbance throughout the entire course of the disease. The evacuation of the abdominal cavity for a time suspended the function that was going on, but the kidneys still being incapable of their natural amount of exercise, an increased salivary discharge resulted, and in this vicarious action, urea again found an exit. As the kidneys resumed their activity, the morbid excitement of the salivary glands diminished."

This example, one of the clearest in the literature, shows one of nature's economical processes whereby one set of organs is brought into play for the elimination of foreign substances, when the proper organs are out of order.

Conclusion.—From a perusal of these pages, it will be seen that there are many interesting points in connection with saliva, some of which have only been worked out "in embryo." As through the lapse of time we observe the wonderful improvement in technic and the broadening out of ideals, we see that the work on saliva has also broadened its field. Our forefathers in research have made many mistakes which we have in part corrected, but they had not discovered everything and so it remains to us of the present day to evolve new schemes and to attempt new methods of diagnosis. An indication of this kind is in working on tuberculous saliva which the writer is now doing. Another indication of just as profound value is in trying to detect urea in the saliva in cases of eclampsia. I have no doubt that many readers will have thought of other possibilities. The urine nowadays is examined for everything; and yet it is only a few years that this has been the case. Hardly anyone denies that its examination helps decidedly in diagnosis. It is only in the last two or three decades that we have examined the stomach contents of patients and yet its examination is of paramount importance. So we may find that in the future the examination of the saliva will also play a decided part in the diagnostic arsenal.

BIBLIOGRAPHY.

1. Renouard's History of Medicine.
2. Lancet, 1841. Vol. I.
3. Lancet, 1841-2. Vol. II.
4. Traité de la Pathologie de Chirurgie, Cap. V.
5. Encyclop. Chirurg., lib. 17.
6. Journal de Physique, 1788.
7. Baly's Müller, Vol. I.
8. Amer. Jour. of Physiol. Vol. I, Chittenden and Ely.
9. Amer. Jour. of Physiol. Vol. I, Chittenden and Richards.
10. Combe, Physiology of Digestion.
11. Archiv f. d. ges. Physiol., 1897. LXV.
12. Paris, Pharmacol. eighth edition.
13. Tuczek Zeitschr. f. Biologie, Ed. 12.
14. Hammarsten's Physiological Chemistry.
15. Fundament. Medic, cap. V.
16. Yale College Studies, Vol. I, 1885, Chittenden and Smith.
17. Dissert. de saliv. necess. inspect., c. 6-10.
18. Jour. de Chemie Medicale, Avril, 1833.
19. St. Thomas Hosp. Reports, Vol. XXI.
20. A. Haig, London. 1903, Uric Acid in the Causation of Diseases.

SURGERY OF THE GALL-BLADDER AND DUCTS.*

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WHEN speaking of cholecystitis at the present date, the surgeon does not of necessity mean that only an inflammatory condition of this viscus is present, but assumes that the term be taken in its fuller clinical significance that of an inflammatory condition of the gall-bladder possibly complicated with stones, etc., and as such I will consider this portion of the paper.

It is necessary to eliminate from our minds the old idea that attacks of pain and periods of inflammation of this viscus are due to the presence of stones, as, not only has this been proven in an experimental sense, but we are meeting constantly with cases of marked inflammatory conditions with all the symptoms of stone in which no stones are present upon operating. Naturally for a period of time this practical demonstration was clouded by the haze of the question of presence of calculi at a former time, and that they were expelled before operative interference was undertaken. In more recent years experimental research with controls showed that pain typical of that supposed to be produced by expulsion of stones, was or could be due to efforts at expulsion of the contents of an inflamed, or distended and inflamed gall-bladder, no matter whether these contents were bile, mucus or pus, stones, or a mixture of all these.

This fact being brought so forcibly to our knowledge has done more for the surgery of cholecystitis than years of medical observation and washing of feces for the presence of stones, so that now we operate not only for the relief of cholelithiasis, but also, and quite frequently, for empyema of the gall-bladder, hydrops, etc.

With the foregoing facts it must be admitted that the presence of stone or stones in the gall-bladder, etc., is a marked predisposing factor in producing cholecystitis. We can but admit that the constant or even occasional rubbing of the mucous membrane of the gall-bladder by stone

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may eventually produce a desquamation at some point or points, and then the active microorganism finds its proper bed and medium for propagation.

Experimental research has demonstrated that a sterile body introduced into the gall-bladder will not produce a stone, but that the injection into a sterile gall-bladder of certain microorganisms, such as the typhoid or colon bacilli will be followed by their formation. Further, it is proven at almost every operation when cultures are taken of the contents of the gall-bladder, and microscopical and bacteriological study of the stones is made that one or the other of these bacilli are present in both stone and fluid contents.

Clinically it is also known that those who have suffered from typhoid are more prone to have this disease than those who have not, and that sufferers from typhoid are very prone to have acute cholecystitis as one of the complications. A rarer form of complication is that of perforation of the gall-bladder. (See John F. Erdmann, *Annals of Surgery*, June, 1903.)

How these bacilli enter the gall-bladder to produce the inflammatory condition has been ably demonstrated by Dr. Lartigan, of Columbia College, who maintains that the blood current is responsible for their presence in the liver, and from that organ they are taken up by the bile ducts and find a repository in the gall-bladder. There they may remain inactive for years. Recently I operated upon a case in which the bladder contained 33 stones and clear bile. Culture showed bacillus of typhoid but no other microorganism. This patient, five years before had fever in Cuba, and began to have his first gall-bladder symptoms one year before the operation.

It is admitted also, that microorganisms may possibly enter the gall-bladder and ducts by means of the Vaterian papilla from the intestines.

For the proper consideration of the subject we must recognize the acute and chronic conditions. We cannot ally this disease, in its dangers to appendicitis, in either of its forms, as in the former instance we have a distensible and well-nourished organ, while in the latter we have an organ not well supplied with muscle fiber nor well supplied with arterial distribution. Given a case of acute cholecystitis, we can say in its early stage that we are satisfied that neither gangrene nor perforation will occur in a few hours, nor under ordinary circumstances in a day, while in many cases of appendicitis we know that either of the above may occur in a few hours. Again, the anatomico-surgical relations of the gall-bladder are such that even if a perforation should occur, the general peritoneal cavity would not be invaded until the right pouch bounded by the gall-bladder, colon, and omentum, etc., had been invaded. In other words, with a case of acute cholecystitis we are justified in waiting for a time for the development of ultra acute symptoms or subsidence of the attack with a far greater degree of safety than in an appendicitis.

I would therefore suggest in acute cholecystitis, especially if a typhoidal complication, that a waiting plan is far better than an ultra urgency operative procedure. I do not wish by the above assertion to convey the impression that I never advocate operation in acute cholecystitis for there are cases in which the symptoms such as septic manifestations, danger of rupture or gangrene by over distention, etc., demand immediate interference when seen by the surgeon. And even in these cases it is safe to say that they have been under the observation of the family attendant for a longer period than a case of acute appendicitis would be.

The operative steps, etc., are the same for acute and chronic cholecystitis, and will be considered under the latter.

Chronic Cholecystitis.—These are the cases in which stones are most likely to be found. The history is not one of short duration but is likely to extend over a period of considerable time with evidences of exacerbation and subsidence, and demand operative interference for the relief of pain, gastric and intestinal manifestations, to prevent perforation by ulceration, etc., either into a neighboring viscus or into the general peritoneal cavity, and finally, to prevent malignant degenerations or formations.

Diagnosis.—We cannot always differentiate between cholecystitis, appendicitis, or pancreatitis, nor eliminate the presence of each or either of these latter from a cholecystitis. Far too frequently we find upon operation that the pancreas has undergone an induration or hardening due to either an acute or chronic inflammation. The same is to be emphasized with reference to the appendix. Bearing these complications or concomitant invasions in mind, it is far wiser when operating always to explore both of these structures. Should such be the case, then the removal of the appendix or drainage of the pancreatic and biliary region is demanded. Given a rigid or tense upper segment of the right rectus with pain deep seated in the region of the gall-bladder, the diagnosis, at least tentative of cholecystitis, is tenable. If in addition we have the history of pain radiating to the right shoulder and a tumor in the gall-bladder region, the diagnosis can be positive. Jaundice is never a symptom of cholecystitis except the hepatic or common ducts be obstructed either by interior or exterior means. Temperature and chills in the history point to the presence of pus either in the sac, *i.e.*, an empyema of the gall-bladder or an infection of the gall-duct, *i.e.*, cholangitis.

Operation.—The incision practised by me has always been the perpendicular one, splitting the rectus. The intercostal nerves of supply to the rectus are to be saved when possible, although their division, when necessary, does not, I am convinced, tend to any great extent to atrophy of the rectus, at least of sufficient degree to materially aid in the formation of hernia.

When necessary to lengthen the incision, this can be done by either extending it in a curve along the costal arch toward the xiphoid, or, as

has been practised recently, the cartilages of the ninth, eighth, and seventh ribs can be split and this chondro-diphragmatic flap can be raised with retractors. The T incision, cutting the fibers of the rectus transversely, although practised once by me, has never since been found necessary in all operative manipulations even including difficult duct work.

After incising the peritoneum it is necessary in some instances particularly in chronic cases to remember the enlargement of a portion of one of the lobes, known by the name of Riedel's lobe. This is very likely to be mistaken at first for the gall-bladder. The best method of finding the gall-bladder in those cases where it is not enlarged is to locate the main fissure of the liver, and then pass the fingers downward in the direction of the transverse fissure.

When the bladder is found it is my custom, when possible, to enter the foramen of Winslow with the index and middle finger of my left hand so as to have the structures of the gastro-hepatic omentum between these fingers and the thumb. Then a search can be made for stone in the duct. The next step is walling off the surrounding viscera by gauze packing so as to prevent contact infection by the contents of the bladder in case they are infected. It is not always easy in a tensely distended bladder to diagnose the presence of stone, and therefore some of the fluid may be withdrawn by means of an aspirator, or by cutting a small hole in the fundus and sponging up the leakage as fast as it appears, then clamping this hole to prevent further leakage or soiling.

At the present time it is my custom after proving the presence or absence of stone in the common duct, and packing to prevent soiling of the surrounding viscera, to cut a hole in the fundus of the bladder, grasp the edges of this incision with forceps and have my assistant sponge away the leakage. As this proceeds, traction is made upon the forceps holding the fundus, gradually pulling the bladder well out of the abdomen when possible, enlarging the incision in its wall, and examining the interior of the bladder with a finger. Should stones be present they are removed and then the disposal of the gall-bladder is considered.

Should the bladder be filled with stones, then as in Case I, no opening is made in it, but complete removal is proceeded with without delay. Should the contents be largely pus with stone or not, and no evidence by history, etc., of cholangitis, then cholecystectomy is done, provided the patient's condition admits of it. Should there be evidence that speed in operating or drainage be required, cholecystotomy is performed.

Cholecystotomy.—In doing this operation I take a purse-string suture about the edges of the opening in the gall-bladder, being careful to see that the serous membrane is inverted and tie in a tube previously wrapped in sterile gauze; a few sutures between the parietal peritoneum and the gall-bladder are taken, the original packing withdrawn. A piece of gauze drain is introduced well down into Morrison's pouch and another surrounds the gall bladder, protecting the viscera against overflow or leakage infection. These drains are removed during the first week, and the tube removed when the bile returns clear or is diminished to a very great degree. This usually occurs within four to eight days. After the tube has been removed, a small gauze drain is employed until the sinus is closed.

I have for some time ceased doing the operation of Mayo, in which he dissects out the mucous membrane previous to drainage, except in cases where adhesions are so extensive as to prevent the dissection of the gall-bladder without great danger to the surrounding structures, and feel that where we can take time to do this operation in ordinary cases that cholecystectomy should be done with drainage or not of the duct as symptoms may indicate.

Cholecystectomy.—This operation has many advantages over that of cholecystotomy, some of which are: No danger of recurrence, no necessity for secondary operation, no soiling of the patient by leakage, etc., more rapid convalescence with less danger of hernia, although this danger is slight in any type of operative procedure, complete or practically complete eradication of the infected area, etc., thereby limiting the dangers of prolonged septic discharge and the great possibility of absorption of putrid material. The operation is one of considerable ease, and when once fairly understood should be done in preference to cholecystotomy, but for the beginner in gall-bladder surgery, I would advise cholecystotomy in preference to the more radical operation.

As a preliminary to cholecystectomy I would advise, as in common duct work, the use of a sand cushion under the back in the upper lumbar region. This brings the duct attachment in closer relation to the abdominal wall and facilitates the operative task very greatly.

After the bladder is exposed an incision is made on either side through the peritoneum so as to make a flap to fill in the raw surface of the liver made by removal of the bladder. After one has found the cleavage between the serous and muscular coats the separation is readily made by the finger. Some assistance is to be gained by insinuating the finger between the cystic duct and adjacent tissues, and then working upward and toward the cystic fissure. The hemorrhage is free oozing and readily checked by packing with the exception of bleeding from the cystic artery, although this may be met with at the last of the stripping or in cutting away the bladder, and can be readily controlled by clamp and ligation. In case no drainage is decided upon, the duct is tied off and treated in any of the ways proceeded with in the stump in appendix operations. Should the case be an infected one, drainage is made down to the stump with a strip or two of gauze. In case the ducts are to be drained, we leave it, *i.e.*, the cystic, open or split it down to the common duct, then either sew with catgut a

rubber tube to the edges of the opening, packing gauze around the tube, or drain with gauze strips. The former of these methods is advised as the rubber tube carries off the flow of infected material much better for the first few days. The catgut suture is absorbed before the time for the removal of the tube is indicated.

Malignancy of the bladder calls for cholecystectomy, when possible.

Cysticotomy or incision of the cystic duct is done for impaction of stone, or for drainage of the cystic and common ducts.

Common Duct.—In addition to stone as a cause, obstruction may be due to malignancy of the duct itself or malignancy of surrounding viscera of such degree as to produce pressure sufficient to prevent the flow of bile into the intestines. Operative procedure will then depend entirely upon the extent of invasion, varying from removal of the diseased tissue to a cholecystenterostomy or allied anastomosis of the gall-bladder and intestines, provided, in these cases of bladder and intestine anastomoses, the malignancy does not prevent the flow of bile into the gall-bladder. Stone may occupy any portion of the duct. When in the course of the duct, its removal is accomplished by incising over the stone, extracting it, and then draining the ducts, or preliminary sutures may be taken over the site of the stone, cutting between the sutures, and after extraction tying them so as to close the operative wound and prevent leakage. I do not believe any procedure of suture necessary, as these wounds heal spontaneously if properly drained.

Should the stone be lodged in the mouth of the Vaterian papilla or its immediate vicinity, one or two operations may be performed, either the transduodenal operation of McBurney or the postduodenal one advocated—but not as yet done—by Dr. A. A. Berg (see *Annals of Surgery*, August, 1903, p. 275), and by C. M. Cooper, who reports three cases successfully done by his method (see *Annals of Surgery*, September, 1903, p. 480).

Should drainage of the common duct be advisable, this can be continued for as long a time as necessary by introducing a rubber tube into the common duct, sewing it there or not, and proceeding as advised in drainage of the cystic, etc.

After-treatment of these cases is often complicated in the first few days by persistent and almost uncontrollable vomiting. Bile excretion is often very much increased in the early morning hours, from 1 to 4 A.M., and is particularly disagreeable by reason of soiling of dressings and the skin irritation resulting. The flow can be markedly diminished by giving the patient a cracker or bit of toast and milk about 11 or 12 P.M., while the skin irritation is overcome by free use of an ointment of ichthyol, from ten to thirty-three per cent.

When drainage has been done flatulency with distention chiefly limited to the epigastric and umbilical region is a depressing feature. This is readily remedied by the use of 5 to 10 grains of powdered ox-gall every four hours, continued from two to four days.

A brief history of a few illustrative cases is herewith appended, showing some of the various cases of interest occurring in my practice in the past few years:

Case I.—Cholelithiasis, Cholecystectomy, Choledochotomy, etc.—Female, forty-five years of age operated upon two years ago. Gave a history of biliary colic for a number of years. In the early part of her disease the attacks were infrequent, one or two a year; they then, as time passed on, became more frequent, three or five a year. After another period of time they became as frequent as one attack a month. When seen by me in the fall of 1901 she was having attacks every few weeks, requiring from one-half to one grain of morphine at a time. Gall-stones were found in the feces. Her examination showed a woman well nourished, no jaundice, no temperature; history distinctive of gall-bladder invasion; pressure in the epigastric region produced marked pain; some tumefaction, taken for the gall-bladder. Operation.—Upon exposure of the bladder it was found to be filled with stones to such an extent that nodulations due to them could be felt all over the wall; no apparent evidence of any fluid in the bladder. Palpation of the common and cystic ducts revealed numbers of stones; hepatic duct was dilated, elongated, and also filled with stones. A complete cholecystectomy was done without opening the bladder, cysticotomy, choledochotomy and incision of the hepatic duct were done, that is, the cystic duct was cut wide open to the common duct, common duct incised, hepatic duct also cut; twenty stones, size of marrow-fat peas were extracted from these ducts; the upper portion of the common and hepatic ducts where incised were sewed, and the lower portion of the common was left open for drainage; a tube was introduced into the common duct and the wound packed with gauze. Recovery was rapid, the patient being discharged within four weeks. About one year after, she reported that she had had one attack of pain. This evidently was due to a small stone left beyond reach in the hepatic duct, although I introduced a blunt uterine curette well into the dilated hepatic duct while removing the calculi.

Case II.—Cholecystitis, Ideal Cholecystotomy.—A widow, forty-five years of age, emaciated, no jaundice; history of uneasiness, pain very slight, indigestion, gastric and intestinal manifestations, some flatus; sense of weight in right half of abdomen; one or two attacks only in a period of four years, the pain at which times was not sufficient to require an anodyne, but was relieved by applications of heat, etc. Palpation revealed a tumor extending well into the right lumbar region; tumor was fixed and was suspected by a number of consultants to be a malignant growth of the ascending colon. I was of the opinion that it was gall-bladder disease, whether malignant or enlarged by distention not known. Exploration

revealed enlarged gall-bladder six inches long, congested and filled with bile and also containing a stone 1½ inch long by an inch in its transverse diameter. The gall-bladder was sponged out, the stone extracted from its point of impaction in the cystic duct; incision in gall-bladder closed by two rows of suture, a small strip of gauze placed in apposition with the line of suture, and the abdominal incision closed up to the point of the drain; drainage removed in forty-eight hours. Patient made prompt recovery, and has had no further attacks.

This is the only case in which I have done the ideal operation of cholecystotomy, and do not feel at the present date that we are justified in doing the ideal operation. Had I this case to do again, I should, without question, do a cholecystectomy, as it was a typical case for such an operation.

Case III.—Cholelithiasis, Cholecystotomy, Cysticotomy and Choledochotomy.—A man, thirty-five years of age, history of an injury thirteen years before by a plank falling and striking him in the region of the gall-bladder. Within a few months following this injury he had typical attacks of biliary colic; this was followed by numerous attacks, increasing in frequency and intensity; up to the time at which I saw him. He had lost very greatly in weight, and would often have attacks of jaundice, although not accompanying every attack of biliary colic. A diagnosis of cholelithiasis invading the common duct was made. Operation was extremely difficult owing to the adhesions which masked any possibility of differentiating the viscera in this region. The gall-bladder was finally found, contracted and filled with stones; the ducts markedly dilated and all filled with stones, over three hundred stones being removed from the gall-bladder and ducts. A lithotomy scoop was passed into the ducts a distance of four inches, scooping out at each maneuver small quantities of calculi; a drain was placed in and the wound packed. The flow of bile was quite excessive and with it numerous small stones were discharged each day. This washing out of calculi by the bile continued for over two weeks, sometimes as high as forty and fifty being picked out of the dressings. Owing to the dissection of the adhesions a fistula formed in the transverse colon. Successive attempts at closure were unsuccessful, but at the time of discharge only a small sinus was left. It was rather interesting to note the rapid increase in flesh the patient made, even while in the hospital. Within a period of three or four weeks he gained twenty pounds. Within a period of six months after his operation, the patient had gained fifty pounds.

The benefit of the drain of the duct in this instance, although no septic process was present, is readily seen by the fact of the discharge of small calculi which were washed out of the hepatic and biliary ducts of the liver.

Case IV.—Acute Pancreatitis, Cholelithiasis, Cholecystotomy.—A woman fifty-two years of age; had been a sufferer from attacks of supposed biliary colic for several years; when seen by me was suffering from epigastric pain; pulse 120; slight elevation of temperature; peculiar dyspnea; mild degree of cyanosis; patient's general condition bad. Diagnosis of acute cholecystitis; abdominal section made, and upon cutting through the peritoneum, a large quantity of fluid resembling beef tea was expelled; small white patches were seen all over the omentum and mesentery; gall-bladder distended and filled with stones. Diagnosis changed to acute pancreatitis with fat necrosis and cholelithiasis. Gall-bladder opened hurriedly; two thousand three hundred and fifty stones extracted; patient died in forty-eight hours. Examination of the specimen of the omentum showed typical fat necrosis.

Cases V. and VI.—Ultra Acute Cholecystitis, Cholecystotomy.—I have recently been called upon to operate upon two cases of ultra acute cholecystitis, both occurring in people under forty, one a trained nurse of the age of twenty-eight, and one a priest at the age of thirty-five. In the nurse eighteen very small stones, rough mulberry in character, were found in a distended gall-bladder; no pus evident macroscopically. In the priest three very small smooth stones were found, the gall-bladder also distended and no pus macroscopically found. The pulse and temperature in both these cases were practically alike, the temperature rising rapidly to 104° F. in the first twelve hours, pulse varying from 120 to 132; intense pain; tenderness in the region of the gall-bladder; general expression bad. Both these cases were operated upon in emergency; cholecystotomy done in each case; ultra acute symptoms subsided in twelve hours after the operation.

Case VII.—Cholecystitis, Pregnancy Five and One-half Months, Cholecystectomy.—Patient thirty-eight years of age; history of gall-bladder invasion, dating from a period of four years or more when seen by me; had been diagnosed by some other physicians as floating kidney. When seen by me with family physician, had a temperature of 101⅗° F., pulse 126; woman fairly well nourished; tumor in the right hypochondriac region about the size of an orange; exquisitely sensitive; cutaneous hyperesthesia marked; uterus on a line with the umbilicus. Refused operation; reported next day not any better; again advised operation; not accepted; reported on the second day following, condition worse; operation accepted. Upon exposure, gall-bladder was found to be 9½ inches long from the cystic duct to fundus; fundus was four inches across; bladder covered with numerous necrotic areas; large quantity of fluid resembling beef tea; omentum walling off this region; stone found impacted in the mouth of the cystic duct; cystic and common ducts palpated with negative result; gall-bladder released from adhesions and opened with a knife; large quantity of fluid expelled; edges of the incision grasped with forceps and the gall-bladder brought well up on the abdominal wall; the remainder of the fluid was sponged out and a stone,

which was 2½ inches long, 1½ inch through its diameter, weighing 550 grains was removed from the mouth of the cystic duct. Cholecystectomy was done, accompanied by profuse oozing, readily checked by means of gauze packing; a ligature was tied about the cystic duct; gall-bladder excised; stump of cystic touched with carbolic acid; large gauze drain inserted down to the duct, another small one into Morrison's pouch; drainage removed on the seventh day; patient miscarried twelve hours after the operation; discharged from the hospital in the middle of the third week with a small sinus left. It was interesting to note in this case the rapidity of repair; the small incision (four inches long) through which a cholecystectomy was done, and the fact that although a number of necrotic spots were evident upon the gall-bladder surface, no slough or active suppuration took place. Had a cholecystotomy been done, the patient would not have been discharged short of five or seven weeks, and an immense amount of slough and suppurating of the diseased gall-bladder would of necessity have followed.

Case VIII.—Cholelithiasis, Stone in Common Duct, Choledochotomy.—Female, about thirty-three years old, suffered from biliary colic for a number of years; lost in weight over forty pounds in four years, although at the present time is a woman fairly well nourished; appearance of jaundice; diagnosis of common duct invasion. Operation revealed stone in the middle of common duct. This was one of the easiest exposures of the common duct that I have ever had or ever seen. Patient had a marked diastasis of the recti muscles, evidently due to a pregnancy. This made a particularly lax abdominal wall; the duct itself could be raised from its posterior attachments very easily. No attempt at preliminary suturing was done in this operation; the duct was cut directly over the site of stone; stone extracted about the size of a filbert; drain put in down to the point of the incised duct; abdomen closed up to the point of the drain; patient discharged from hospital the third week. At the expiration of eight months the patient had gained twenty pounds.

THE REGULATION OF THE DURATION OF EXPOSURE AND THE DISTANCE FROM THE TUBE IN X-RAY THERAPY.*

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THE first question an X-ray operator has to determine is at what distance shall the tube be placed from the patient and what shall be the duration of the exposure.

In the literature on this subject there is an especial want of observation on these practical points. One can readily see why such details have not been given. The component parts of different machines and tubes vary. Every outfit has its several variable and controlling factors, different combinations of which bring about a different quality of X-light with its corresponding effectiveness. A great deal has to be learned by experiment and experience with each outfit. Fairly definite directions, however, can be given in regard to these factors even if they be only general and relative. If we fix the other controlling factors and make them constant we can with a fair degree of accuracy prescribe the treatment measured in time and distance.

Besides the latter two we recognize in every outfit as controlling and variable factors the degree of vacuum of the tube, the resistance in the circuit and the quantity of electricity (amperage). The penetration of the light is dependent upon the degree of vacuum and the resistance in the circuit and the intensity is dependent upon the quantity of electricity.

The degree of vacuum and the resistance can be regulated and made constant factors by means of the vacuum and spark-gap regulators. The volume of electricity is governed by the speed of the plates in the static machine and in the coil by the speed of the interrupter and the current supplied to the primary. These can be governed by the regulators provided for the purpose.

If we render constant the penetrating quality and the intensity of the light we need then consider only the time and distance.

The accompanying table is given to show the relative effect at different distances based upon the rule that applies to all forms of radiant energy that the intensity varies inversely as the square of the distance.

Distance.	Relative intensity.			Safety limits.
2	1	1,000	25.00	2.5
4	¼	.250	6.25	10.0
6	1/9	.111	2.77	22.5
8	1/16	.062	1.56	40.0
10	1/25	.040	1.00	62.5
12	1/36	.027	.69	90.0
14	1/49	.020	.51	122.5
16	1/64	.015	.39	160.0
18	1/81	.012	.30	202.5
20	1/100	.010	.25	250.0

In the first column are the distances at two-inch intervals. In the second are the relative intensities expressed in fractions. In the third are the same expressed in decimals. In the fourth are the relative intensities expressed in decimals taking the intensity at ten inches as unity. This column is useful, since ten inches is the average distance for an exposure; when one wishes to estimate the total amount of treatment given he can by means of this column reduce the exposures which may have been given at various distances to their equivalent at ten inches and then add the number of minutes. In the fifth column are the safety limits or the duration of time which it is safe to expose a patient without danger of a dermatitis. These figures are the result of an experience of nearly two thousand exposures personally given and by experiments in bringing about a redness of the skin by a continuous exposure. The

* Read before the Southern Surgical and Gynecological Association, held in Atlanta, Ga., December 17, 1903.

figures are about one-half of those required to produce a moderate degree of redness of the skin of the forearm with a tube of one ampère and fifteen volts with an equivalent spark-gap in the secondary circuit of five inches.

I have found the column of safety limits a valuable guide in radiographic work, and the knowledge that approximately twice the duration of these exposures under the conditions that I can regulate will produce a dermatitis has been of great value in directing the treatments.

Every outfit as well as the different combinations of the controlling factors will have its respective length of time to produce a dermatitis. Every operator should therefore at first try to determine this point. He can thus avoid undesired and unlooked-for results and foretell by several days the effects that occur.

The fear of unexpected and harmful results has been too much exaggerated. There is no more reason why we should fear the danger from the rays than from strychnine. Both are powerful therapeutic agents capable of regulation. They should be prescribed and used within their limits and according to the indications.

The treatment of deep growths requires especial attention to the time and distance. The difficulty in reaching them has been the danger of injuring the superficial tissues before the deep growths are affected. Now we know it is not necessary to bring about a necrotic inflammation to destroy a cancer. If we can have the rays penetrate the tissues with moderate uniformity we can then hope to destroy the deep growths. The closer the part is to the tube the greater is the difference in the effect upon the skin and the part beneath. For instance, suppose we have a growth four inches from the surface and the surface four inches from the anode: According to our table the effect on the skin would be represented by .250 and that on the growth .062, or a difference of .188. Of course this does not take into consideration the loss of intensity due to penetrating the tissues. If the surface of the skin be placed at eight inches the growth will be at twelve; the relative effects will be .062 and .027, or a difference of .035. With the skin at sixteen inches and the growth at twenty the relative effects are .015 and .010, with a difference of .005. We thus see that the further the part is from the tube the less is the difference between the effect on the skin and the part beneath. We should therefore place the part far off and make due compensation by increasing the duration of exposure directly as the square of the distance, or by referring to the table one can determine the duration for the exposure. My rule is not to expose in ten days more than the number of minutes required to produce a dermatitis. As this point is approached the exposures are shorter and at longer intervals in order to watch developments. As soon as the redness is reached and its degree determined, the treatment can be continued and directed according to the indications.

I realize that in the above remarks there are vulnerable points, but it is a tendency toward a more rational technic based upon a physical law. The sooner we bring our technic under fixed laws the more uniform and more successful will be our results.

SEA-BATHING IN SOME FORMS OF SKIN DISEASES.*

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SEA-BATHING, whether used as a luxury or employed as a remedy, is limited to a fraction of the year. This being the case, expensive trials and experiments with this measure in any form of skin affections can hardly be undertaken with success. This reason probably accounts for the remarkable paucity of literature on the subject. For diligent research and personal inquiry failed to elicit any information on the influence of sea-bathing in diseases of the skin.

My experience with this method of treating some forms of skin diseases extends but over two summers, yet the success attained in each case sufficiently warrants the suggesting, if not the recommending, of sea-bathing as a reliable and curative agent in certain skin affections.

This paper deals briefly with forms of cutaneous diseases which have manifested a willingness, as it were, to yield to the influence of sea-bathing. There are others which appear to be equally amenable to the same agent, but the observations regarding them are as yet immature.

My list embraces the following diseases: Pityriasis versicolor, six cases; Herpes tonsurans maculosus et squamosus, three cases; Chronic eczema, five cases; Pruritus senilis, two cases.

To avoid unnecessary repetition one case of each form of the diseases mentioned will be cited for illustration.

Case of pityriasis versicolor: The victim was a young man, a lawyer, twenty-five years old. He was afflicted with that disease for several years. The blotches extended on the front and back of the trunk, neck and arms. Both his ability to secure the best advice and his anxiety to get rid of the disfigurement, which prompted him to carry out every suggested measure, failed to cure him. Two summers ago the patient was advised sea-bathing. After taking a dozen baths the disgusting affection disappeared.

Now I am well aware that pityriasis versicolor is far from being the opprobrium of dermatology. Indeed some authors consider it a one-night-cure disease. Still, cases come up from time to time which defy all care and the very best of remedies. They will persist in returning in spite of your best efforts. They are like the will-o'-the-wisp.

*Read before the New York State Medical Ass'n, October 20, 1903.

Sea-bathing in these stubborn forms is a remedy par excellence.

But more signal success has been achieved in the treatment of a skin disease which occurs less frequently and is of much longer duration, even under treatment, than the one previously considered. I refer to acute general Herpes tonsurans maculosus et squamosus.

Let me cite one typical case, history and treatment. A girl, aged twelve years, had an attack of this disease in the beginning of June this year. The eruption extended over the trunk and the extremities. First, there appeared small, red, flat papules. Then, in two days, the papules turned into small patches. Both papules and patches were covered with oily scales. The exfoliation began at the center of each path, and gradually ended at the periphery, leaving the point from which it started pale and depressed. Shortly, typical rings formed from which occurrence and peculiarity the disease is commonly known as ringworm of the body. The itching was extremely intense and distressing.

Sea-bathing was suggested for no other reason than pure experiment. The child took ten baths in ten days and got rid of her trouble. In this case there was observed a total absence from all forms of medication—internally or externally. Sea-bathing alone received the credit for the cure.

It may be well to mention that both of these affections of the skin are parasitic in origin. Pityriasis versicolor is eminently so and is universally acknowledged to be caused by the fungus *Microsporon furfur*. Herpes tonsurans maculosus is caused by the *Trichophyton tonsurans;* this causation, however, is not so universally accepted; some maintain that it is an external expression of gastro-intestinal disturbance, as was lately argued in an extremely interesting and elaborate paper by my friend Dr. Ludwig Weiss.

The mycotic origin of these diseases is alluded to because of the apprehension that some might claim that sea-water containing, as it does, iodine, bromine and other antiparasitic elements and compounds which have the reputation, on terra firma, as being inimical to the life and growth of low forms of animal and vegetable organisms, produces the curative effect on the diseases of the skin. But the following cases will demonstrate the efficiency of sea-bathing in diseases of the skin which are positively non-mycotic.

A man, about forty-five years, suffered from gout and rheumatism for ten years. Within the last year he gradually developed dry eczematous patches on his shoulders, legs and hands and lumbar region. The induration, furrows and color of the skin were typical of chronic eczema. The itching was so intensely excruciating that both rest at day and sleep at night were unknown for many a month. Every form of treatment was employed without avail. Sea-bathing was finally recommended. Two baths a day were taken for a period of ten weeks with complete satisfaction to the sufferer. While traces of the old foe are left in slightly perceptible hardness of the affected skin and pigmentation, the troublesome affection disappeared, apparently for good.

The last case to mention in which sea-bathing was a veritable godsend was a man of seventy years, who had pruritus senilis of long standing. In his case, as in a good many other similar cases no eruption was visible nor a cause discoverable except a susceptible, irritable skin.

Daily ocean dips were advised and taken during the entire summer with the result of freeing the homo senilis from his horrible pruritus.

Now for comparison and comment: Assuming that the therapeutic virtue of sea-bathing rests in the chemical composition of the sea water, I directed a few of my patients who suffered from diseases of the skin above mentioned to bathe in tanks filled with ocean water such as are found in some of the regular Russian and Turkish bathing establishments—tanks of water which are considered "as fresh as the sea but safer." I must confess the utter failure to obtain any appreciable results. In view of this, the comment and conclusion inevitably are that bathing in the sea, besides the inherent properties of the medicated water, derives additional value from some other sources which are, I believe, first the longer immersion which is possible because it is more agreeable in the sea; second, the pounding of the billows which rubs the water more thoroughly into the skin; third, the exposure to the sun in the interval of the dips, which dries the solids of the water into the skin, and lastly, the rolling on the sand of the beach which wonderfully helps to remove scales and other pathological débris from the skin, and thus affords the water a better chance to penetrate the affected areas.

These reasonings may sound far fetched, yet a harmless theory is better than none.

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PERICARDITIS; WITH THE REPORT OF CASES.*

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THE object of this paper is not for the purpose of presenting new points but to distinctly emphasize three points: First, the insidious development of pericarditis, and how frequently it is overlooked unless particularly sought for. Second, that pericarditis of a severe type may develop during the course of a very mild pneumonia. Third, the difficulty of distinguishing obliterative pericarditis from acute general tuberculosis involving the serous membranes.

Pericarditis may be classified as primary or idiopathic and secondary. This latter form occurs most frequently after acute articular rheumatism, septic processes rank next to rheumatism, in tuberculosis it may occur as a part of the gen-

* Read before the Medical Society of Troy, N.Y., and Vicinity.

eral involvement of the serous membranes or succeed extensive pulmonary lesions. Among other causes may be placed acute eruptive fevers, Bright's disease, diabetes, scurvy, etc.

Pathologically, pericarditis may be classified as dry and moist. It generally begins as the dry form, in which there is at first a redness of the membrane which soon becomes lusterless and is later more or less covered by an exudate of fibrin. The amount of fibrin may be small or great. The moist form is as a rule an advanced stage of the dry form. The exudate may be serous, sanguineous or purulent depending on the etiology. The hemorrhagic form occurs in tuberculosis and in cancer. The disease may terminate in one of several ways: (1) It may end in resolution by absorption of the exudate: (2) it may become chronic and dense bands of adhesions form between the two layers of the pericardium and also between the pericardium and the surrounding structures. (3) The purulent form may rupture into the esophagus, pleuræ, stomach or even into a bronchus. The pus may become inspissated and later a deposit of lime salts ensue.

Pericarditis, as has already been said, is very often overlooked on account of its insidious onset. Very often no subjective symptoms are present at the onset of the disease and the diagnosis can be made only after a very careful physical examination. If during the course of an acute infectious disease the rhythm of the pulse becomes altered, or its rate increases out of proportion to the rise of temperature, or the heart's action becomes tumultuous, or a sudden rise of temperature takes place, a careful physical examination of the heart should be made. On the other hand, the onset of pericarditis may be marked by severe pain, which may be anginal in character. The form with effusion may present characteristic symptoms as altered cardiac rhythm, precordial distress, aphonia dyspnea, dysphagia, cough and other symptoms of pressure, and often a very active delirium.

In the majority of cases the diagnosis is made from the physical signs. In the dry form there is one sign which is of diagnostic importance, and that is the pericardial friction rub which may be single or a to-and-fro rub and is intensified by pressure on the stethoscope. If it is single it is generally systolic in time.

The friction rub of pericarditis may be confused with the pleural friction, the pleuropericardial friction or an organic heart murmur. The friction of dry pleurisy disappears on holding the breath while the pericardial friction rub is not altered. From a pleuropericardial friction it is more difficult to differentiate it, as both are present during the cessation of respiration. The pleuropericardial friction becomes more intense during inspiration and less during expiration, while the pericardial friction is not altered. From an organic heart murmur it is differentiated by the time and transmission of the murmur and the character of the pulse. Another important sign which is often present is the friction fremitus.

In pericarditis with effusion the signs are more numerous, but vary with the amount of fluid: *Inspection.*—There may be bulging of the precordium and complete or partial obliteration of the intercostal spaces. The apical impulse if seen is feeble and is often seen upward and to the left. *Palpation.*—The apical impulse is feeble or absent. *Percussion.*—The cardiac area of dulness is increased in size. The area of dulness is triangular in outline with its base below and its apex directed toward the junction of the third left rib and the margin of the sternum.

If the effusion is large there may be detected in the left infrascapular region, an area of dulness due to compression of the lung. *Auscultation.*—The friction sound heard in the first stage may entirely disappear at this time. The heart sounds are feeble and distant, the first sound may lose its muscular element and resemble the second sound. Bronchial breathing, due to compression of the lung, may be present in the left infrascapular region corresponding to the above mentioned area of dulness.

The diagnosis of pericarditis with effusion may be confused with dilatation of the heart. In the latter, the apical impulse is generally visible and wavy. The area of dulness is not triangular. The cardiac sounds are sharp, clear and not distant.

Case I.—This patient entered the hospital as one of probable typhoid fever, which disease its symptoms strongly suggested, on January 28, 1903; is a male, twenty years of age, boiler maker by occupation, from whom the following anamnesis was obtained. Family history is perfectly negative in regard to anything that has bearing on his present condition. He had gonorrhea two years ago and has never been ill otherwise until the present illness. Present illness began five days before admission, with pain in the abdomen, severe frontal headache, loss of appetite, looseness of the bowels and a slight cough. As these symptoms resembled typhoid fever, the Widal and Ehrlich's diazo reactions were performed and both were negative. The blood examination showed hemoglobin 70 per cent.; red corpuscles 3,500,000, and white cells 17,000 per cm. (The hyperleucocytosis directed our attention to some infectious process, thus showing the value of blood examinations.) The urine was negative. The sputum was mucopurulent, blood stained and contained pus cells and the diplococci of pneumonia.

Physical Examination.—The patient was well developed and of good musculature. The lungs were negative except for a small area of dulness at the base of the left lung posteriorly. Over this area, vocal fremitus and resonance were increased and fine crepitant râles and bronchovesicular breathing were heard. Heart sounds and cardiac dulness normal. The pulse was of good character. Liver was overlapped above by vesiculotympanitic note and the liver dulness extended slightly below the free border of the ribs. Spleen was slightly enlarged. Abdomen slightly

distended and tympanitic. Other organs, reflexes and sensations were normal.

January 31, four days after admission, the onset of the pericarditis was detected by the presence of a to-and-fro friction rub heard in the third left intercostal space and was not transmitted from the precordium nor altered by the cessation of respiration.

February 9, ten days after the onset of the pericarditis, the following signs were detected: *Percussion.*—The cardiac area of dulness began at the third left rib, at the level of the fifth rib it extended 19 cms. to the left of the midsternal line. The apical impulse was within this area of dulness. *Ausculation.*—The cardiac sounds were feeble and distant. The respiratory murmur and voice sounds were absent in the precordium. Previous to the advent of these signs there was no change in the subjective or objective symptoms except that the patient's countenance became dusky and anxious. At the time of appearance of the friction the pulse rose to 120 with no change in temperature or respirations, but during the formation of the effusion the temperature was 104° F., the pulse 130 and the respirations 40. In the latter part of the illness the pulse became irregular. The fluid disappeared to a considerable degree but soon returned and the patient is still under observation at the hospital.

Case II.—Male, aged twenty-two years, born in Turkey, buttonholer by occupation. *Family History.*—Father and some other relatives died of consumption. Mother alive and well. Patient has always been well until the present illness, which began in March, 1902, when, following a severe "cold" he became short of breath on exertion, had pain in the epigastrium and back, and had a severe cough. He entered the Samaritan Hospital in April, 1902, and was treated until June when he left the hospital much improved. During his presence in the hospital his chest was aspirated a number of times, the character of the fluid being serosanguineous. The patient remained in a fairly comfortable condition until two weeks before his last admission, November 29, 1902, when he again became quite short of breath and coughed considerably.

Physical Examination.—Patient is of medium stature, scanty musculature, pale, poorly nourished. The lower intercostal spaces are effaced especially on the left side, recession of the supra- and infraclavicular spaces, respiratory movements are greatly restricted especially on the left side. Vocal fremitus is absent below the level of the third rib and exaggerated above. *Percussion.*—Anteriorly, absolute dulness below the level of the third rib, the upper limit of dulness reaches a higher point in the axillæ. Posteriorly, the dulness extends from one inch below the angles of the scapulæ to the free border of the ribs. Posteriorly there is on the right side a small area of increased vocal fremitus and resonance, bronchovesicular breathing is also heard here. *Auscultation.*—Respiratory murmur is harsh above the level of the third rib and lost below. Vocal resonance is marked above and decreased below the level of the third rib. Apical impulse neither visible nor palpable. Heart sounds are feeble with reduplication of the first sound. Cardiac dulness obscured by the effusion. Pulse is small and rapid. Liver and spleen are normal. In the latter part of November fluid began to collect in the abdomen and ascites developed to a considerable degree. A little later the hands, feet, legs and thighs became quite edematous. About six weeks later a pericardial rub was detected but it disappeared in the course of a week or two. The cardiac sounds became feebler and distant and the pulse irregular. Dyspnea and cough became very annoying at times but were relieved after removal of part of the effusion. The right pleural sac was tapped twice but no fluid was found. The left pleural sac was tapped eleven times, the total amount of fluid removed was 20 pints. The abdomen was tapped once and 20 ounces of fluid removed. The fluid returned very soon after removal. The fluid was serosanguineous and under microscopical examination no bacteria were found. The sputum has been repeatedly examined but no tubercle bacilli were present. Blood examination showed 7,500 white cells per cmm. The lymphocytes slightly exceeded the normal number. The urine was negative.

This latter case is of interest because of the liability of confusing it with the disease to which F. Pick, of Prague, called the attention of the medical profession, and to which he gave the name of pseudo cirrhosis of the liver due to obliterative pericarditis. The principal symptoms of this disease are ascites, dyspnea, slight edema of the extremities, cyanosis, enlargement of the liver and the local signs of pericarditis. In differentiating this case from Pick's disease several factors must be considered. The effusion in the chest, the ascites and the general anasarca made their appearance before the pericardium was affected; while in Pick's disease the pericarditis is the primary cause of the accumulations of fluid. The liver was not enlarged as in obliterative pericarditis. The fluid drawn from the abdomen was inflammatory in character, *i.e.*, sanguineous and not simply serous as in transudations. The edema of the extremities was early in the course of the disease and was very great; in Pick's disease the anasarca is late, and, as a rule not very great.

The process having started some time ago in the lung and later involving the pleuræ together with the character of the fluid withdrawn and the loss of weight, etc., point toward the tuberculous process.

In conclusion it will be well to mention a few of the important signs of adherent chronic pericarditis: (1) A systolic retraction in the region of the apex. (2) The sign described by Broadbent, which is a distinct systolic retraction of the chest wall in the region of the eleventh and twelfth ribs on the left side. (3) Friedreich's sign, a collapse of the cervical veins during diastole, and, according to Kussmaul, a swelling

of the cervical veins during inspiration. (4) The pulsus paradoxus is significant of adherent pericarditis or rather of the dilatation which follows. The pulse becomes small and feeble during inspiration, due to traction on the adhesions during the inspiratory expansion of the lungs. As these bands are drawn upon it causes a constriction of the vessels of the mediastinum; thus resulting in a small feeble pulse wave during inspiration.

INDICATORS IN GASTRIC ANALYSIS, WITH SPECIAL REFERENCE TO TROPEOLIN OO.

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MY attention has recently been called to this matter, partly by a study of various practical problems in physiological chemistry, and partly by various articles which have appeared on the subject in the medical literature.

In spite of being an originator of a method of gastric analysis dealing directly with proteid digestion, it seems to me that we must all admit that the most important detail in the chemic analysis of chyme is the acidity and, especially, hydrochloric acidity.

Two methods of measuring hydrochloric acid by titration have received the attention of the profession. In one, the investigandum is treated with decinormal sodium hydroxid solution with an indicator in the capsule; in the other, a drop of investigandum is removed from time to time during the titration and is tested qualitatively for free mineral acid. The latter method is very tedious and almost necessarily requires a preliminary titration by the former method but is, I believe, far more accurate. One of two reagents may be employed—the phloroglucin-vanillin and the resorcin-saccharose solution. Either one of these when heated short of charring, drop for drop of investigandum, yields a brilliant crimson ring in the presence of a mineral acid. Personally, I have not used the phloroglucin-vanillin test for about ten years, as the resorcin-saccharose reagent is more stable and while said to be a trifle less delicate, it will detect one part of hydrochloric acid in 4-5,000 of diluent. In other words, its delicacy is sufficient for practical purposes. In experimenting with dilutions of pure hydrochloric acid, we can determine the end reaction between crimson and dull yellow within two or three degrees of the titration. In experimenting with chyme, there is a pretty sharp change from crimson to rose and from this to dull yellow. The rose color probably indicates a freeing, by heat, of hydrochloric acid in organic combination or the action of fermentation acids or both.

In gastric analysis and similar work, the term degree or per cent. of acidity refers to an amount of decinormal monobasic alkali solution equal to one per cent. of the investigandum and as the latter is usually 10 c.c., a degree corresponds to $^1/_{10}$ of 1 c.c. in the burette.

In the method of titration with an indicator in the capsule with the investigandum, dimethylamido-azobenzol is commonly employed, although, formerly, Congo red, tropeolin OO, and even benzopurpurin and various other dyes, were employed. A series of experiments, reported last year in *American Medicine*, have convinced me that dimethyl (those of us who have become familiar with it, use its first name alone for the sake of brevity) gives too high results by about 15 degrees, if we take as the end reaction, the final color change, but that we must read the free hydrochloric acid at the point where the bright cherry-red changes to orange and this point can be corroborated by noting also the final discharge of color and making the subtraction of 15 degrees.

Total acidity is indicated most conveniently by using phenolphthalein as an indicator. This reaction is sharp within a few degrees of gradual development of color and is considered fairly accurate by chemists. In states of euchlorhydria (25 to 50 degrees of hydrochloric acid), the total acidity will vary between 3 and 2 times the free hydrochloric acidity. In hyperchlorhydria, the total acidity will range between 2 and 1½ times the free hydrochloric.

Between free hydrochloric acid and total acidity, we have fermentation acids, acid salts—principally phosphates—and combined hydrochloric acidity. Nothing definite is known about combinations of proteid and fermentation acids. In accordance with the general principle that a strong acid supplants a weak one, hydrochloric acid will be neutralized before the vegetable and fatty acids. The principal organic acids found in chyme are acetic, lactic and butyric, but various others occur. These cannot be readily separated, either quantitatively or qualitatively. On account of the antiseptic action of hydrochloric acid, however, large quantities of organic acids probably never develop in a stomach with regularly high hydrochloric acidity, although, if the eu- or hyperchlorhydria is merely temporary or if there is ischochymia, there may be considerable organic acidity in the presence of a relatively high hydrochloric acidity.

How shall we separate the various acidities intermediate between free hydrochloric acid and the total reaction with phenolphthalein? Aside from investigations on the incinerated chyme, two methods have been proposed. One depends upon the following reaction: Proteid chloride plus sodium tungstate equals sodium chloride plus proteid tungstate, the last being insoluble and neutral to phenolphthalein, whereas proteid chloride (combined hydrochloric acid) is acid to this indicator. As I pointed out in the report previously mentioned, this statement is only measurably true. While a marked fall in acidity by phenolphthalein occurs after adding neutral sodium tungstate to the investigandum, while we are reading the burette, we observe that the pink color has become discharged, we recover the color by adding a few drops more of the alkali

solution and the same phenomenon is repeated and, if we let the test stand for a few hours, we can gradually run the acidity up to almost exactly the same reading as before we added the tungstate. Personally, I am by no means convinced that the diminution in the immediate total acidity correctly indicates combined hydrochloric acid—aside from the matter of phosphates to be considered later—but, if we use this method at all, we must read at the first transient change of color with phenolphthalein.

The other method for estimating combined hydrochloric acid is based on the hypothesis that alizarin changes from olive to purple when we have saturated everything but combined hydrochloric acid. Thus, by subtracting the dimethyl from the alizarin end-point, we get organic and phosphatic acidity while, by subtracting the latter from the phenolphthalein end-point, we get combined hydrochloric acid. But, very commonly, we find by this method, a relatively enormous amount of combined hydrochloric acid when the free HCl is low and when everything points to a deficiency of hydrochloric secretion and digestion in general. I have even seen instances in which the final color change with dimethyl occurred at a point beyond alizarin. Dr. G. H. A. Clowes, of Buffalo, has published in the *American Journal of Pharmacy* for June, 1903, an interesting article* on the estimation of phosphates in chyme depending upon the fact that the alizarin end-point occurs at the transition from H_3PO_4 to NaH_2PO_4 and the phenolphthalein end-point at the next transition from NaH_2PO_4 to Na_2HPO_4, while Na_3PO_4 is formed only in an excess of alkali. However, it is obvious that phosphates as well as combined hydrochloric acid lie between the alizarin and phenolphthalein end-points and, in many cases, as when phosphates are administered medicinally, this disturbing factor is very important.

The general consensus of opinion with regard to tritrations of chyme, is that the estimation of free hydrochloric acid is approximate, the estimation of total acidicity quite exact, and that the alizarin or sodium tungstate methods are very inexact, though better than nothing. This sentiment is significant, as some clinicians are disposed to draw very fine lines with titrations and, in particular, Dr. Knapp's interesting article, in the MEDICAL NEWS of Nov. 14, 1903, is entitled "Why Not Absolute Precision in Chyme Analysis?" Even incineration methods are not regarded as absolutely precise without regard to the general fallibility of mankind, and titration methods must be accepted as merely approximate, though usually sufficiently accurate for diagnosis and treatment.

A very practical consideration is the amount of investigandum to be used for each test and what tests are to be omitted if the chyme is scanty. The old statement that 20 to 30 c.c. is the normal amount of residue one hour after a standard test breakfast, must have been due to inadequate methods of extraction. Within the last year or two, I have almost discarded expression and my roller tube-stripper and now rely on a bulb syringe with strong walls—such as is commonly sold to keep the population within limits. By alternate suction and moderate distention of the stomach with air, while the tube is held at various levels, one can remove almost every drop of chyme and can tell by the sound and the patency of the tube, when the extraction is complete. By this method, 40 to 100 c.c. may be taken as normal limits, one hour after a meal of 50 grams of bread and butter and 250 c.c. of water, or thereabouts.

Whenever possible, all manipulations should be upon the filtered chyme. It was formerly stated that the minute particles of unfiltered chyme held acid and therefore results were minified by working with filtrate. I believe this observation is mainly due to the fact that with unfiltered investigandum, one cannot tell just when he has reached an end reaction and thus has to add an excess. Sometimes the reverse is true. For instance, in vomited matter after a meal of brown bread, etc., the dimethyl test apparently yielded an unmeasurable trace of free hydrochloric acid. The filtrate showed 27 degrees (to the orange point).

As a rule, when very little material is available, the dimethyl test and the phenolphthalein test should be used in succession. If 10 c.c. cannot be obtained—as in some cases of mucous gastritis with little secretion but with good motility—the degrees are estimated from the actual reading by the rule of three. One cubic centimeter is sufficient for the tests for lactic acid, ferment activity and carbohydrates, bile, blood, etc. The next 10 c.c. I would use for my proteolysis test. (*See Journal American Medical Association*, March, 1901.) Afterward the alizarin and other tests may be applied and various experimental study may be made on cases of supersecretion.

As a rule, 10 c.c. should be used as an investigandum to avoid the experimental error which always attaches to readings made with small quantities and two or three tests made as accurately as possible, are of greater value than a number made with small quantities of chyme. There seems to be no objection to employing phenolphthalein in the same capsule with the investigandum previously used with dimethyl for the determination of free hydrochloric acid. Otherwise, the mixture of tints is liable to obscure the reaction. I have recently seen an article in which, with 5 c.c. as an investigandum, the author made four successive titrations in the same capsule, putting in one indicator after another. Such admixture of colors is too artistic for the plain digestive specialist.

Although advocating the use of dimethyl as a routine reagent for free hydrochloric acid, some of my critics, notably Dr. Knapp, in the issue of

* The article quoted is too technical for ordinary clinicians and contains one or two misprints which an inexpert chemist would not notice. The writer, with Dr. Clowes' kind permission, expects to take up this method from a clinical standpoint later.

the MEDICAL NEWS of November 14, 1903, have attributed to me a partisanship which I do not feel and have not tried to express. So far as I understand the chemistry of indicators, neither this nor any other can be an accurate measure of any one acid. In other words, the change of tint is a phenomenon of ionization and not at all a specific combination such as occurs in the ordinary reactions of inorganic chemistry. I was among the first clinical writers to call attention to the fact that the phloroglucin-vanillin reaction occurred with any mineral acid and not alone with hydrochloric acid and, in general, whatever indicator is used, we must expect that vegetable acids will act analogously to mineral, but to a less degree. There is no satisfactory definition of acidity, but, in a vague way, we can conceive of it as due to the position of hydrogen in a molecule. Not everything that we customarily write with an H or OH separate from the rest of the molecule, is an acid, and some substances are amphoteric, acting as acid or otherwise, according to the indicator used. Carbolic acid, for instance, acts as an acid with comparatively few indicators.

In choosing among the various indicators which mark the turning point from free acid to acid salt or organic combination, we must be guided by empiricism as to the one which produces the most distinct change and the change least influenced by weak acids. We must not overlook the fact that a delicate, limited indicator may react when a more general but less delicate indicator will not. Thus, it occasionally happens that by using benzopurpurin or Congo red and resorcin-sugar, we get the paradoxical result: "No free acid, trace of free hydrochloric acid."

The discrepant reports of different observers with regard to the virtues and faults of the various indicators used, may, perhaps, be explained by individual differences in visual physiology or, possibly, by actual histologic variations in the rods and cones. It is absurd to suppose that any one would wilfully misrepresent what he saw and almost equally absurd that one working day after day in chemic problems of the same general nature, should make a blunder of observation. We know that there are well-marked variations in tone-perception and that marked color blindness exists. It is reasonable to suppose that in dealing with delicate changes of tint, different eyes should literally see things differently.

Every little while some advocate turns up with an indicator that we have discarded several years ago. In the MEDICAL NEWS of January 27, 1894, I published a little scheme for the qualitative examination of chyme, including a study of some reactions with indicators. Congo reacts blue, not only with hydrochloric acid and the mineral acids generally, but with lactic, acetic and butyric acids, the last giving a turbid blue. Tropeolin OO changes from what I would call magenta to yellow, in titrating against a mineral acid, with alkali. Lactic acid restores the magenta color, but neither acetic nor butyric do so in any reasonable amount. Thus, tropeolin is a better indicator for hydrochloric acid than Congo. These statements I have just verified, in view of the contradictory statements which have been made. Tropeolin is, at least for me, an undesirable indicator because the tint with acid is obscured by a brownish or yellowish cast of the investigandum and because the end-point is difficult of detection. Using dimethyl, on the other hand, we start with an unmistakable cherry-red and, while the change to orange is a little vague, it is not more so than the single color change of tropeolin. The final color change of dimethyl is almost identical with that of tropeolin but we have two reactions as a check on each other, in the former instance. In the absence of a large amount of fermentation acidity, the dimethyl and tropeolin tests will come out about the same. With my method of noting the change from cherry to orange, for example, in one sample the total acidity was 68 degrees. By dimethyl, the hydrochloric acid was 24 degrees, the final discharge of color occurring at 36 degrees. By tropeolin the hydrochloric acid was 22 degrees. Even a considerable amount of acetic or lactic acids, or both, will not restore the cherry red of dimethyl, but will change the color back from yellow to orange.

Really, it makes comparatively little difference which of several indicators is used provided one understands that the results are approximate and reliable only for comparative purposes. With low hydrochloric acid and high fermentation acidity, the readings of the burette are very inaccurate although they indicate the principles of therapeutics clearly enough. Whenever it is necessary to have accurate tests made, the chyme must be incinerated.

PHYSIOLOGICAL AND CLINICAL ASPECTS OF HYDROTHERAPY WITH ITS SPECIAL REFERENCE TO THE TREATMENT OF PYSCHOSES.*

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"HYDROTHERAPY includes the application of water in any form, from the solid and fluid to vapor; from ice to steam, internally and externally."

The use of water in the treatment of disease is not new. Hippocrates, we read, made intelligent use of the stimulating and relaxing effects of heat and cold. Coming down through medical history we find the greatest physicians exponents of the remedial use of water. Among them are Celsus, the physician to Ovid and Fabius Maximus, Paulus Æginita in the eighth century and Van der Huyden in the twelfth century.

In 1697 a book published by an English physican named Floyer attracted the attention of the best medical minds of Germany, and adopting his

* Read before the Morristown Medical Club, October 28, 1903.

ideas water was used in the treatment of fevers and the exanthemata, but it did not become popular until the "peasant water doctor," Priessnitz, in 1840 attracted a considerable following and so spread his ideas throughout the world. To Prof. Wilhelm Winternitz, is due the credit of putting hydrotherapy upon a scientific basis. He has devoted his life to the study of its great clinical value and the scope of its application, and has thus gathered about him at Kaltenleutgebene over two thousand patients. In 1861 Ernest Brand published his results with cold baths in the treatment of typhoid fever. At this time France and Italy were also making progress in this line, though many times delayed because of the unwonted notoriety given it by lay practitioners and fanatics. This was especially so in England, where even to-day hydrotherapy is not generally popular. In the United States the early champions of hydrotherapy were Drs. Abram Jacobi, of New York City, and Hiram Corson, of Pennsylvania, followed by Dr. Simon Baruch, who has done most for its scientific progress and development, until to-day our hydriatric institutions are the best equipped in the world and in them the exact prescription of the physician may be carried out by skilled nurses. Fortunately it is not necessary to have expensive apparatus, and gratifying results may be obtained with the ordinary household toilet accessories. But technique must be zealously guarded.

Being much interested in this subject I have at the New Jersey State Hospital at Morris Plains fitted up an apparatus for douching by which the temperature and pressure could be regulated and with packs, drip-sheets, bed-baths and hot-air baths, have during the past eighteen months done considerable work among the insane, especially in melancholia, dementia præcox and psychoses of a neurasthenic and hysterical type, and I believe that no other single therapeutic measure so thoroughly tones the nervous system, so stimulates the circulatory apparatus and so satisfactorily revives organic activity.

When we think of the vast area of the skin, its structure and function, with its myriad of nerve endings, its muscular and elastic tissues, its glands and vessels, all of which are directly accessible to the effects of this agent, we may get a glimpse of its physiological action and have something of an understanding of the channels through which we may obtain more definite physiological results.

From a hydrotherapeutic standpoint we deal with the skin as a sense organ, as an excretory organ and as a heat regulator. The physical properties of water are such that the functions of the skin are directly affected by this form of application of heat and cold. From ice (32° F.) to steam (212° F.) we may use this agent with perfect mechanical control and definite knowledge of its physiological effects. By reason of its fluidity we have the advantage of being able to apply it in any desired manner, thus definitely affecting local or general areas, while the application of pressure enables us to obtain the very important mechanical irritation of the nerve-endings and other structures of the skin. It is very interesting to study the various results possible with such a flexible agent, from the awakening to the destruction of cell activity.

Primarily the action of water, no matter how used, is that of an irritant to the peripheral sensory nerve-endings, and in this reflex way affects the circulation, respiration, temperature, tissue change and secretion.

Reflex irritation of the sensory nerves affects the circulation in two ways—by acting upon the heart muscle increasing its power, and by changing the caliber and tone of the vessel walls. This applies to both topical and general applications. Cold causes a primary acceleration of the heart's action, followed by slowing and added force—increasing the heart's nutritional period in the same manner as digitalis. Heat causes a primary slowing of the heart's action, followed by acceleration.

Acting on the cutaneous vessels, both heat and cold cause a primary contraction, followed by secondary dilatation. The secondary effect of cold is dilatation, accompanied by increased volume, tension, tone and blood pressure. This is due to stimulation of the inhibitory nerves. A beautiful example of this is found in the person who goes out into the cold rain or hail; first the face is blanched by capillary contraction, after which it assumes a rosy red hue due to capillary dilatation and a more active circulation. If the stimulation is continued or excessive, however, temporary paralysis of the vessel wall follows. The secondary effect of heat is dilatation, accompanied by increased volume but decreased tone, tension and blood pressure. This is due to relaxation of the vessel walls. Therefore we may liken the effect of cold to an active congestion and that of heat to a passive congestion.

The composition of the blood is also altered. Cold causes an absolute increase of both white and red cells in the peripheral circulation, the increase of white cells being very marked. This is probably due to increased force of the circulation and altered tone of the vessels which forces the blood cells from organs in which accumulation has taken place. The maximum increase in red cells has been stated as 1,860,000, while the white cells have increased threefold, and the hemoglobin fourteen per cent. These alterations persist for from one to two hours, generally being at their height at the end of one hour. Heat causes a decrease in the number of red cells, a decrease in the percentage of hemoglobin and a slight increase in the number of white cells.

Since the heat regulating function of the skin has to do with the vessels, nerve-endings and glands, we may pass it over as the conclusions are obvious and it is by no means as important as the stimulating effects on the nervous and vascular systems.

Scientific experiment has shown that tissue change and its consequent secretion and excretion

are greatly enhanced or controlled by properly applied hydriatric procedures.

The following are a few of the most important hydriatric procedures: Simple ablution, which consists in the application of water by the hand or what not, without much friction, useful in febrile conditions and as a measure introducing more vigorous proceedings. It is apropos to say here that friction of the skin by the bare hand or the hand covered with cloth is important to the success of any hydriatric procedure. By friction, reaction is brought about, for the nerve-endings seem to need a certain amount of mechanical irritation. The non-observance of this principle is the cause of failure with those who have given up this method of treatment. It is also necessary in any hydriatric procedure to place a cold compress or turban upon the head, and this to be changed frequently.

The *half bath;* in which the water in the tub reaches just above the pelvis and is kept at a temperature of 85° to 70° F. The nurse first bathes the face and then rubs the body with one hand and with the other dashes water on the patient, who, if he is able, keeps up friction on the front of his body with his own hands. This measure is one degree further than the ablution and serves to dilate the peripheral vessels more than does the pressure-laden full bath. It should last from five to ten minutes—as the physical signs indicate—after which the patient should be rapidly dried in a previously warmed linen sheet or blanket.

Next in order for consideration is the *affusion.* In this procedure water is dashed upon the body with more volume and greater force, as from a pitcher or pail at some height. It is of short duration, but the intermittent character of the thermo-mechanical irritation causes a better reaction than either of the before-mentioned measures. Thus this procedure is of use when we wish more shock and stimulation, as when in the delirium of acute diseases we have a tired heart, inactive vessels and inefficient respiratory effort. The temperature of the water may be from 70° to 45° F., varying within this range in accordance with the symptoms presented.

The *sheet bath* must always command studious attention. This bath may be used in its different forms—cold rub and drip sheet—as an antipyretic, stimulating or sedative measure. In the simple cold rub the sheet wrung fr[illegible]water at 68° F. is wrapped about the patien[illegible]snugly; first underneath and then over the [illegible]ns and about the shoulders. The patient is then rubbed vigorously until warm and dry. It is customary, for the sake of better reaction, to precede this measure by previously warming the skin. This method is used for its stimulating and tonic effect. When an antipyretic action is desired, water of the same or lower temperature is poured or sprinkled upon the sheet and friction kept up until the part is again dry. This method is generally followed with the patient in bed. For a sedative action, the drip sheet is used—that is, the sheet is wrapped around the body without being wrung out and friction and slapping alternated with pouring, over the head and shoulders, water at a temperature ten degrees lower than that of the sheet. It has been found that having a patient stand in water from 100° to 90° F. aids greatly in asthenic cases.

A universally useful and valuable measure is the *wet pack.* In this a woolen blanket is placed on the previously protected bed and on this is laid a well-wrung out linen sheet. The patient, wearing a cold turban, lies upon the sheet and is wrapped snugly and so that no two skin surfaces come together. The arms are raised and one-half of the sheet is brought across the upper portion of the body and tucked along the trunk, the lower portion being placed between the legs, then the arms are brought to the sides and the remaining half of the sheet is brought over and tucked snugly about the entire body. The blanket is now wrapped firmly around the body, covering in the shoulders and the feet, great care being taken to prevent a layer of air between the blanket and the sheet. Another blanket may now be placed over the patient and tucked underneath him, accurately fitting the body curves and giving him the appearance of a mummy. The sheet should be wrung from water at a temperature of from 70° to 60° F. When it is desirable to use a higher temperature, as from 100° to 110° F., for excretory purposes, it is better to use a thin flannel blanket in place of the sheet as it more readily retains the heat. A pack of short duration—one-half to one hour—is markedly sedative, causing, after reaction has set in, muscular relaxation, cerebral anemia and oftentimes sleep. In longer duration, say one to five hours, the pack acts also as an excretory agent, the desired elimination being aided by the ingestion of several glasses of water during the pack. Cell activity is increased, resulting in combustion of autotoxines, making them soluble and easy of elimination. The skin is filled with heated blood and thus excretes more actively as the odor of the sheet testifies. The wet pack is also of use as an antipyretic measure and when this result is desired it should be frequently repeated and of short duration, as from ten to thirty minutes. It is also of great use in chronic diseases exhibiting deficient tissue change and in neuroses as a measure preliminary to the invigorating half-bath or douche. In this connection it is well to bear in mind that the wet compress is simply a miniature pack, and when used for throat or pulmonary disease or for maintaining the effect of other antipyretic and stimulating agencies, is very pleasing in its results, as will be attested by all patients to whom they have been properly applied.

The *cold full bath,* especially the Brand bath in typhoid fever, is so well known that I need not make mention of it here. The *warm full bath,* aside from its analgesic effect, it attended with highly gratifying results in the treatment of children and babies, where at a temperatue of from 100° to 95° F. and of a duration of ten minutes,

it is a most useful antipyretic and sedative. Care must always be taken to keep the bath at the prescribed temperature by adding hot water from time to time.

No article upon hydrotherapy would be in any sense complete without reference to the *douche*. In the use of the douche atmospheric pressure takes the place of direct friction and as the size and shape of the stream can be regulated as well as the temperature and pressure, it becomes a scientific method of application. The mechanical irritation of the douche is so marked that it readily overcomes the effect of cold and even makes a moderately warm spray of short duration, stimulating. Reaction is found much more active if the douche is preceded by some measure for warming the skin surface, such as the pack or hot-air bath, thus increasing the shock and rendering the stimulation consequently greater. It is also a very useful measure for restoring tone to the vessels of the skin after packs or other relaxing baths. It prevents chilling, allows the patient to take exercise in the open air and receive the benefit of deepened respiration, more active circulation and awakened metabolism. The douche should be limited to from twenty seconds to one minute, the temperature from 45° to 105° F., the pressure from fifteen to thirty pounds. In the douche, as in other hydriatric proceedings, we have a great power for evil as well as for good. The exact technic must be followed in order to assure success. Each case demands separate and careful study for the reason that by varying the temperature, pressure or duration, widely different effects are possible. It is generally necessary to educate most patients to the point where the desired measure may be used. The Scotch douche consisting of alternating streams of hot and cold water, is a measure which has found much favor as a general stimulant and as an excitant of tissue change.

The various hydriatric measures adopted in a given case will depend upon the disease, the condition of the patient and the particular result desired.

In measles, when the temperature is high—103° F.—and the nervous system shows the effect of toxemia, Dr. Baruch advises a full bath at 95° F., lowered gradually to 75° F. if necessary to obtain the desired effect; in severe cases showing delirium, stupor, muttering and restlessness the half bath at 95° F. with cold affusions at 75° F., repeated every three hours, or more often if necessary. These baths should be brief, for children having measles do not bear well the abstraction of heat.

In scarlet fever during the acutely toxic stage, practically the same procedures are recommended. If a severe nephritis is present, a full bath at 95° F., gradually cooled to 90° F., is given, lasting from five to eight minutes. The patient is then placed in a warm blanket pack for an hour or longer to promote diaphoresis, cold water being freely given to increase diuresis.

In pneumonia we deal with a very severe toxemia acting upon the nervous system and nothing so successfully combats these symptoms as properly applied hydriatric measures. In children a full bath at 95° F., with active friction, will strengthen the heart, deepen respiration, reduce the temperature and refresh the child. These baths may be given every three hours for a temperature of 103° F. and in the meantime their effect maintained by a chest compress. If the nervous symptoms are very marked the child may be held in a half bath of 100° F., while affusions at 75° to 60° F. are used and these followed by a rapid drying with friction. A fact to be remembered, however, is that children do not bear shock nor chilling well and that the temperature of pneumonia is much more easily reduced than that of most other infections. In the pneumonia of adults Dr. Baruch does not advise baths but uses the cold chest compress at 60° F. He finds that this measure sufficiently reduces the temperature and being applied as often as indicated aids in the elimination of toxins, stimulates the heart and has a decided effect on the course of the disease. Some of the most gratifying results of hydrotherapy are obtained in the treatment of enterocolitis of young children, where as a means of overcoming the nervous exhaustion and inanition the bath or pack has come to have a value as great as in typhoid fever. Prostration and marked nervous symptoms are often rapid and severe. The skin is white and covered with clammy sweat, while the rectal temperature runs from 102° to 106° F. Here the carefully graded bath is of much value. The child should be put in a full bath at 90° F. The face and head are bathed with cold water; gentle friction is kept up and the water gradually reduced to 80° F. If more shock is desired, because of severe nervous symptoms, affusions at 60° F. may be used. The bath should not last over ten minutes. Afterward, if the temperature has been high, the child is wrapped in a sheet covered by a blanket and allowed to dry. If the temperature has been low, the child is gently dried and placed in bed. When the child has convulsions or there are objections to the baths on the part of the parents, the wet pack, from 70° to 60° F. may be used, lasting from fifteen minutes to twenty minutes and repeated if required. After this pack the patient should be laved with a cloth partially wrung out in water at 70° F. One has but to observe the pulse in such conditions become slower and regular, respiration deeper, the eyes brighter and animation and color return, to be satisfied with the value of these measures.

In my more recent work among the nervous and insane I have found the wet pack at 65° F. or the full bath at 95° to 105° F. very useful in excited cases and in insomnia, and have at present a case of mild excitement with confusion in which the patient seems to change to nearly the normal state while in the pack. She exhibits a slight temperature—100° to 101° F.—a quickened high-tension pulse—95 to 100—extensive herpes labialis, foul breath and inactive bowels, making

a perfect picture of mild toxemia. This patient is placed in a wet pack for three hours each morning and afternoon and her colon irrigated daily with normal salt solution at 110° F. She is fast losing her toxic symptoms and her excitement is daily becoming less marked.

The series of twenty-six cases which I have collected for this paper, which were all under my treatment, are classified as follows. Acute melancholia, acute melancholia with agitation, dementia præcox, hysteria, puerperal insanity.

Most prominent among their mental symptoms were depression, slowness of thought—even to apparent lack of it—little or no interest in self or surroundings, delusions of a painful nature, confusion, depression with agitation, hypochondriasis and insomnia. The most marked physical signs were lack of nervous and muscular tone, sluggish circulation with an almost constant accentuated second heart sound, no appetite, and in some instances even refusal of food, loss of weight, muddy, greasy, acne-covered skin, intestinal fermentation and constipation. The urine was scanty but showed no constant pathological change except in several cases a very slight trace of albumin, which disappeared as metabolism improved.

Where necessary in these cases, because of their weak physical condition or mental apathy, extensive enough to cause them to be kept in bed, treatment was begun with an ablution at 95° F. with active friction, the temperature being reduced 5° F. daily until 65° F. was reached. When the patient became used to this measure and reaction became ready and constant she would be given a sheet bath at a temperature of 60° F. This procedure causes more shock and prepares the patient for the vigorous stimulation of the douche. Those cases which showed depression with agitation and a run down physical condition but with a fairly active skin were given a wet pack at 65° F., lasting for from one to one and one-half hours, from which they were immediately given a general fan douche at 60° F. and twenty-five pounds pressure for twenty seconds, followed by drying with friction and exercise in the open air. Those cases exhibiting stupor, flabby, greasy, acne-covered skin and congested extremities were given the same form of pack but it was continued for from two to three hours, water being given freely during the pack, and where the kidneys were not secreting well the colon was irrigated just before the pack with normal salt solution at a temperature of 110° F. In the cases which exhibited only depression, loss of weight and lack of general muscular and nervous tone the douche alone was used. Having been accustomed if necessary by the use of the ablution and sheet bath, the patient was sprayed for one minute at a temperature of 95° F. and fifteen pounds pressure, then a fan douche was given for twenty seconds at 45° F. and twenty-five pounds pressure, followed by drying with friction and exercise in the open air. The reaction after such treatment is very marked. The respirations are deepened, the pulse is slowed and its tension reduced, the skin glows to a red hue, showing that the reaction is perfect, and the patient feels a general sense of well being.

Resulting from this treatment, the patients become brighter, more interested in things about them and in their own welfare. Agitated cases became calm, sleep was natural and dreamless, delusions were less fixed or gradually faded away and the normal mental state was often restored. The physical condition greatly improves, the appetite increases and with it the body weight—in the average of cases from ten to thirty pounds. The pulse grows strong, regular and of normal tension, the bowels regular and the skin healthy. A notable fact is the improvement in general muscular and nervous tone. The muscles take on firmness and the body curves or feature curves become round and full. This condition is so marked that on going through the wards one can detect from their facial appearance those receiving hydriatric treatment.

In connection with this treatment the patients' habits were regulated; they were given one egg in six ounces of milk every two hours during the day, besides three meals of the regular diet, if they were able to take it. After an initial purging with calomel a daily stool was obtained with tonic doses of cascara sagrada, unless intestinal fermentation was marked, when colon irrigation with water at a temperature of 110° F. was practiced, and they were made to take water internally at regular intervals as a means of aiding in the general process of elimination. Strychnine in tonic doses or the house tonic, consisting of iron, quinine and strychnine, was also given when indicated. I do not claim for hydrotherapy wonderful or miraculous results, but I firmly believe this method of treatment a most invaluable adjunct to hygienic and medicinal measures.

Of this series of cases nine recovered, twelve were greatly improved in both mental and physical health, and five, while they evidenced no mental improvement, gained in general physical health.

MEDICAL PROGRESS.

SURGERY.

Suprarenin in Surgery.—An interesting article by B. Müller (Münch. med. Woch., Feb. 2, 1904) deals with the use of suprarenal extract in major surgery. The preparation known as suprarenin was employed in almost all cases and many experiments convinced the author of the intense action of this substance upon the smaller vessels. If the mucous membrane of the mouth is moistened with a 1-1,000 solution, a pale yellow spot will result; injected into the skin of a dog in a dilution of 1-10,000 an incision could be made without the loss of a single drop of blood and a microscopic examination gave evidence of extreme vascular spasms. Laparotomies can be easily performed, but vessels more than one millimeter wide must be ligated despite the fact that their media often contracts and shuts off the

lumen after division. The pale condition of the tissues enables one to detect and avoid nerves without much trouble. In very bloody operations, such as strumectomies and amputations of the breast, suprarenin is invaluable and in the much-feared resections of the liver it must be regarded as indispensable. In order to avoid injury to the larger vessels and stopping-up of the needle, this is constructed with a blunt, closed end and two lateral openings. Care must be taken to incise within the anemic district and so that more of this lies centripetal to the knife than centrifugal. Spurting from larger vessels is avoided by manual compression of the liver, central to the cut. After-hemorrhages were never observed, since the vessels are effectually shut off by thrombi before relaxation occurs. In one case the stump was examined two days after operation. The process of healing was found absolutely normal, both macro- and microscopically and necrotic areas could not be found. Extirpation is more difficult than resection, since it is often impossible to tell how deeply one must go into the liver. In small cancer nodules or gummata the excision is wedge-shaped and the needle is introduced in the direction of the two incisions. More trouble will be experienced where the gall-bladder is to be removed, especially where the tumor has already extended upon the liver. Large vessels are encountered here in abundance, but suprarenin, by suppressing parenchymatous oozing, allows these to be seized with great ease—a point of great importance in cachectic individuals. In general it may be said that a strength of 1-1,000 to 1-2,000 has an almost instantaneous effect and is best for liver and kidneys; one part in 5 to 10,000 is sufficient for skin, fat and muscle and acts in two minutes. Up to 10 c.cm. of a 1-1,000 solution may be injected without fear of intoxication. Boiling is the most efficient means of sterilization. Weak solutions will decompose in time, but a pink solution is just as active as a colorless one. A 1-10 or 20,000 solution stimulates the heart and one cubic centimeter may even be injected into the myocardium.

New Appliances for Local Hyperemia.—The use of a suction apparatus to produce a local hyperemia has first been suggested by A. BIER (Münch. med. Woch., Feb. 9, 1904), who has devised an ingenious apparatus which can be closely fitted over any joint. As soon as the air is exhausted, the parts will redden and perspire so that the glass walls of the apparatus soon become cloudy. This suction has the same curative action as hot air; it relieves pain and renders tuberculous joints more supple without weakening those suffering from advanced anemia. Various orthopedic appliances can be placed in the apparatus to allow the patient to perform active motion with his diseased joint. The vacuum should not be so high for tuberculous joints as for chronic rheumatism, as the softened bones may be injured. The method is not applicable to acute affections. Another device recommended by the author is a hot-air apparatus with fine movable point, especially indicated in the treatment of trigeminal neuralgia. One should not become discouraged if the effect is not instantaneous, but even obstinate cases were completely relieved after daily applications during two or three months.

Report on Two Cases Operated on by Lorenz.—Two children which were operated on by Lorenz, in San Francisco in 1902, were kept under observation by H. M. SHERMAN (Jour. Am. Med. Ass'n, Feb. 27, 1904), who now publishes a report of their present condition. The plaster dressing was removed in May, 1903, six months after application and X-ray pictures taken and a careful examination made. In the first case where a boy of five years had presented an anterior dislocation, the head was found in a subcutaneous position in the outer part of Scarpa's triangle, while the trochanter was somewhere behind and internal to it. As the condition was unfavorable, the cutting operation was recommended. The latter disclosed that the capsule of the joint had been torn by the manipulations and the head of the bone was left among the muscles at the outer part of Scarpa's triangle. The head was replaced in the very shallow acetabulum, but very little capsule was left in front of it—a serious loss, as the body-weight must be carried by the capsule of the hip-joint, where an anatomic reduction cannot be made. No benefit therefore apparently resulted from the Lorenz method. The second case presented a posterior dislocation and after the cast was taken off examination showed the head to be in the outer part of Scarpa's triangle and very near the skin. No improvement had therefore taken place and the limb was probably shorter than before. Operation was not undertaken.

Case of Staphylococcus Sepsis.—An instance of this condition closely resembling typhoid fever is reported by O. NIEDNER (Deut. med. Woch., Jan. 29, 1904). As the disease was present in his associates, typhoid was diagnosed but all attempts to cultivate bacteria from the blood were negative. Delirium developed on the tenth day and on the fifteenth swelling of the parotid glands was present from which pure cultures of staphylococci were secured. Swelling then also developed over the right trochanter and elbow. The man died two days later. A month previously the patient had fallen from a ladder striking on the right side. The leg became increasingly painful and two weeks later the symptoms of typhoid developed. The parts were actively massaged. The autopsy showed changes in the intestinal lymphatic system which closely resembled those of typhoid and therefore accounted for the clinical course of the disease. The injury had induced extravasation in the right gluteus maximus muscle, which became infected through the skin and resulted in the formation of an abscess, which was situated too deeply to be discovered by palpation. The massage which was done evidently drove the infectious material into the circulation and resulted in a general infection, which rapidly became fatal.

OBSTETRICS AND GYNECOLOGY.

Early Signs of Pregnancy.—The means of diagnosing pregnancy in the early stages are none too convincing, so that any addition to our knowledge of this subject should prove interesting. H. L. E. JOHNSON (Jour. Am. Med. Ass'n, Feb. 20, 1904) describes a physical sign which he has noted in a large number of cases prior to and including the third calendar month. This sign is observed as early as the third week and consists of an intermittent softening and hardening of the vaginal portion of the cervix uteri with, in many cases, a change of color, from a pale violet to the normal pink hue, or the reverse. The alternate softening and hardening are readily detected by digital touch, while the changes in color may be seen through the speculum. These signs are probably the early manifestations of what is subsequently recognized as the intermittent contractions of the pregnant uterus and are probably due to a necessity for some change of modification in the uterine circulation incident to the nourishment and growth of the impregnated ovum through physiologic intermittent congestion of the generative system. This sign the writer has never observed in any other normal or diseased condition and reports a number of cases where the diagnosis of pregnancy was subsequently positively demonstrated where at first it was entirely unsuspected by the patient.

Modification of Porro's Operation.—Porro's operation, first undertaken in 1876, is thus described: After the uterus has been emptied as in an ordinary Cæsarean section, it is drawn out of the abdominal wound and surrounded by a wire at its lower segment. The uterus with its appendages is then cut away. WILLIAM H. HORROCKS (Brit. Med. Jour., Feb. 13, 1904) suggests a modification of this technic, which is upon the lines sometimes employed in the treatment of uterine fibroid. In considering the choice of operations between the Cæsarean section and Porro's operation, there are certain points in favor of the latter technic. In general one or the other of these operations is indicated when the deformity of the pelvis is so great as to render delivery without craniotomy impossible and where some tumor growing from the cervix or sacrum blocks the pelvic cavity. The question of leaving the uterus has always seemed a doubtful point, although cases have been recorded by French surgeons in which several operations have been performed upon the same woman. Of late it has been customary in performing Cæsarean section to sterilize the woman by dividing the Fallopian tubes. If this be done, the settlement of the question resolves itself into a determination as to whether more shock is produced by the removal of the uterus or by its simple section, suture and destruction of the Fallopian tubes. The technic of the author's modification is as follows: Before drawing the uterus out, it may be necessary to ligate the broad ligaments on each side and divide them. After delivery of the uterus through the wound, the peritoneum is stripped off until the neck of the uterus is reached by the finger. The uterine artery is found on each side, and a ligature thrown around it, one side only being tied. The anterior wall of the uterus is now exposed and the muscular tissue torn through with a blunt director down to the membrane. These are now opened sufficiently so as to easily remove the child. As soon as natural respiration is established, the cord is clamped, divided, and the child delivered. The cord, with the forceps is now returned into the uterine cavity, no attempt being made to remove the placenta or the membranes. A flat sponge is packed into the uterine cavity and the opening drawn together. The second ligature is now tightened and the uterus divided as low as possible. The stump is then ligatured with a double set of sutures. A sound should be passed into the bladder to determine its position before attempting to perform the uterine stump. The pelvis is now carefully dried and drainage may or may not be established through Douglas pouch. The special point in this operation is the small amount of shock due to the infinitesimal hemorrhage. The question of tightening the second ligature on the uterine artery before extracting the child is as yet not positively answered.

Puerperal Sepsis.—Even in this hour of perfect asepsis, every one is glad when the third day is over. PETER HOROCKS (Brit. Med Jour., Feb. 13 1904) states that a hundred years ago parturition was so often followed by fever of some kind that Nisbet defined pregnancy "as a certain inflammatory disposition of the body or nearly approaching to it." It was the rule at that time for the woman to run a temperature during the puerperium. It was looked upon as unavoidable and due to the increase in the inflammatory tendency of the blood. Inasmuch as a woman may develop a temperature after she has had a child from any cause that will produce fever in a non-pregnant woman, it becomes necessary in the first place to eliminate all possible causes other than those peculiar to that state. In other words, there is a difference between fever of the puerperium and fever in the puerperium. Strictly speaking, puerperal sepsis includes the following: (1) Puerperal fever or puerperal septicemia of the worst and generally fatal type; (2) puerperal sapremia, which is usually accompanied by an offensive discharge and which is generally recovered from; (3) puerperal pelvic cellulitis, also generally recovered from; (4) puerperal pelvic peritonitis, non-fatal usually; (5) puerperal pyemia, often a late stage of any of the preceding. Fatality depending on virulence of sepsis. (6) Phlegmasia dolens. This is now believed by many to be due to sepsis. (7) Milk fever. Inflammatory; often transient; probably septic; non-fatal.

Fibroid Disease in Five Sisters.—For a family of nine sisters to furnish five examples of fibroid disease and five of cataract is a morbid consensus of more than fleeting interest. J. MACPHERSON LAWRIE (Brit. Med. Jour., Feb. 13, 1904) cites the history of these cases and asks what is the explanation of the peculiar predominance of the two factors—fibroids and cataracts. The pathology of fibromyomata is as little known as that of tumors in general. With regard to cataracts, it is known that impairment of nutrition of the lens increases with advancing age, and that these nutritive defects are apt to manifest themselves earlier in some families than in others. In other words, there is an inherited predisposition to that failure of repair which leads to the formation of opacities in the lens; this form of cataract, however, not being always an expression of senility. Is hereditary influence a factor in the causation of uterine fibroids? Is it possible that these two apparently dissimilar diseases are the resultant symptoms of some unknown underlying cause? The only connection between the uterus and the lens of the eye is a developmental one. The capsule of the lens originates from the same layers of the blastodern as the uterus. The lens is mainly the offspring of mesoblastic elements and is therefore in direct histological relation with muscular and vascular tissues. It seems, therefore, that the relation of cataract to fibroid in this family is either purely accidental, or else of such a profoundly obscure origin as to be extremely hypothetical. This remarkable series, however, would seem to furnish evidence to justify the suspicion that hereditary influence may be a causative factor in the pathogenesis of uterine fibroid tumors. he literature of the subject shows that the majority of writers do not ascribe any importance to the theory of hereditary transmission. The author is frank in stating that he believes this series to have its explanation in coincidence rather than in the expression of any hereditary tendency. This is a conclusion which is very tenable in view of the computation of Klob, who believed that four women in every ten have fibroids.

HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

Neutrophile Leucocytes in Infectious Diseases.—An article containing claims of a very revolutionary character has been published by J. ARNETH (Deut. med. Woch., Jan. 21, 1904), with reference to the previously accepted notions of positive and negative chemotaxis for the neutrophile leucocytes. He believes that the importance and value of leucocytosis have been misunderstood and explains the phenomenon by asserting that the process is due to the destruction of the neutrophile leucocytes, the extent of which is dependent on the degree of infection or intoxication, the resisting powers of the organism and a number of other factors. He has made an extensive investigation of leucocytosis by the aid of a new technic, which however is not revealed at present. This shows that the number of leucocytes is no criterion as to their actual normal or

abnormal condition. The condition of the nucleus is the deciding element and according to its character the leucocytes may be divided into five classes. "Cytosis" is the new term applied to these various conditions and he distinguishes between iso-, aniso-, hyper-, hypo-, and normocytosis. In infectious diseases there is an aniso-hypercytosis (equal and unequal). The investigations also show that the relations between the various forms of leucocytes are much simpler than in the old classification. It is also claimed that the neutrophile leucocytes are the producers, but not exclusively, of the antibodies. Further and more elaborate details are promised in a new book about to be published by the same author.

Tuberculous Stenosis of the Intestine.—In at least half of the cases of stricture of the gut of tuberculous origin, according to A. W. NIKOLJSKI (Samml. klinisch. Vorträge, Dec., 1903), the condition is a secondary one. It is mostly seen between the ages of twenty and forty years, and selects principally the lower part of the ileum. Multiple stenosis is just as common as the single variety. Strictures of the intestine lasting for years are in the great majority of cases tuberculous. The diagnosis is made more probable by the presence of tuberculous foci in the individual or a history of the disease in the family. In cases of stenosis in which the etiology is not clear, the cases are best regarded as tuberculous. The treatment is resection, and success depends on resorting to this precedure early.

Modifications of the Bacillus of Koch.—Certain irregularities noted during the study of the saprophytic characters of the tubercle bacillus have led J. FERRAN (Arch. Méd. Expér., Nov., 1903) to attribute them to a variability in the characters of this organism. The special pathogenic characters of the non-acid tubercle-producing bacteria are best studied before the latter have been transformed into the bacilli of Koch. During their initial virulence these germs are not at all tuberculogenic; they acquire this property only after having been acclimatized to a life within the leucocytes. The demonstration of the constant presence of the non-acid tuberculogenic bacteria in tuberculous individuals, together with their abundance and saprophytic characters, deprives the bacillus of Koch of the right to be considered as the exclusive agent in spontaneous tuberculosis in man.

The Alloxuric Bases in Aseptic Fevers.—A research of extremely practical import was undertaken by A. R. MANDEL (Am. Jour. Physiol., March 1, 1904) with the view of determining the relationship between the cleavage product of the nucleoproteids contained in the cell-nucleus, which products are commonly known as alloxuric or nuclein bases and the fevers of surgical origin. This investigation was suggested by the fact that in cases of surgical lesion there is a marked increase in leucocytes and this increased leucocytosis would lead to an increased production of alloxuric bases. The author found that in such cases there is a correspondence between the quantity of alloxuric bases eliminated in the urine, and the average temperature observed at the same time. As the alloxuric bases increase in amount the quantity of uric acid diminishes and vice versa. On injecting alloxuric bases into a normal monkey there is a rise of temperature. Inasmuch as coffee contains 1-3-7 trimethylxanthin (caffeine), the author sought to determine whether drinking a large quantity of a strong decoction of coffee, produces any rise in temperature. In his own case he found this to be so. He concludes from his observations that in fevers there is a distinct relation between the rise of temperature and the appearance of certain incomplete products of cell oxidation, as shown by the excretion of the alloxuric bodies, whose source must be looked for in the circulating leucocytes or the fixed lymphoid tissue and also probably in other tissue cells. It is noted that individuals, for instance, children with good reactive ability and high leucocytosis, usually show rather high febrile temperatures. The diminution of uric acid corresponds to the increase of alloxuric bases is attributed to the lessened oxidation of the latter to uric acid. It is assumed that in a number of pathological conditions the ability of the cells of the organism to oxidize certain substances is directly interfered with, and that this probably applies to the so-called aseptic fevers, as, for instance, rise of temperature after severe operations, anesthesia, convulsions, poisons, cachexias, of various forms. It is supposed that in all these cases the temporary or more permanent injuries to the cells inhibit their oxidation ability a shorter or longer period.

THERAPEUTICS.

The Climate of Long Island.—The proximity of Long Island to the greatest center of population in this country, and the increasing use of its territory as a resort and place of residence, make valuable any study of its climatic features, so remarks W. H. Ross (Brooklyn Med. Jour., March, 1904). It is for the most part a dry sandy plain, through the center of which runs a range of hills from 100 to 400 feet in height. With only 1,682 square miles of territory it has over 250 miles of water front. The island is made up mainly of sand and gravel, with thin strata of clay at varying depths. This dry, well-drained soil modifies the climate as regards fogs, the latter being more frequent over a wet, clayey soil than over the former. During a period of ten years, the mean summer temperature was 70° F., and that of winter, 30°F. This was at Brentwood in the pine belt and about the center of the island. The mean yearly temperature was 51.8° F., compared with 45° F. for the entire State of New York, 52° F. for the city of New York, and 52.7° F. for Atlantic City. The average temperature of the island for the month of July is three degrees warmer than for neighboring Nantucket, but there is a difference in the relative humidity of 7¾ per cent. in favor of Long Island. This relatively low humidity is one of the striking features, the average for the year being 72.75 per cent., while Atlantic City has 80.5 per cent., and San Diego, 69.5 per cent., only 3 per cent. lower than that of Long Island. The amount of sunshine forms a valuable feature, the average being about three hundred days per year—more than any of the neighboring resorts. Pine forests cover a considerable area, and the yellow pitch pine is indigenous to this region. The climate of Long Island is favorable because of its low altitude in increasing functional activity of circulatory organs; in convalescence from acute diseases, and in surgical diseases to accelerate tissue changes; for all invalids who cannot bear great changes of temperature; for pulmonary tuberculosis because of its pure air, equable temperature and pine forests; for all nervous troubles requiring relaxation, particularly in insomnia due to nervousness.

Podophyllin in Anchylostomiasis.—As the result of observation and experiment, NEUMANN (Deut. med. Woch., Feb. 4, 1904) claims that podophyllin has a specific action on the intestinal epithelium which interferes with the attachment of the parasite. The latter are then easily dislodged by the administration by the extract of male fern after the podophyllin has been given, or the podophyllin may be alone sufficient to expel them. The action of this drug is much more pronounced than that of calomel, and it is apparently a much safer drug for the purpose.

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DECREASE OF FOUNDLINGS' MORTALITY.

THE solution of one problem in sociology or the kindred department of sociological pathology is almost sure to introduce another one of almost as great importance as the first, though its occurrence is usually quite unanticipated. This seems to have occurred with regard to the question of infant mortality in several attempts at its improvement in late years.

It is well known that the custom of insuring the lives of children under one year of age, for the purpose of enabling parents to have enough money to bury them in case death should take place, has been followed, especially in England, where the custom was at one time very common, by a distinct increase in the proportionate mortality of insured infants as compared with the uninsured. At first it was hoped that the insurance would be a distinct benefit for family life. Poor parents almost beggar themselves and frequently starve their children for a time in order to meet the funeral expenses of a dead member of the family. This evil it was hoped life insurance on children would prevent and might even ameliorate family conditions generally by leaving less room for anxiety. In order to prevent the increase of mortality that was noted, however, strict legal regulations had to be enacted with regard to insurance on children's lives and the infantile feature of life insurance development was practically obliterated.

A condition not entirely unlike this has developed recently in some of the large cities of this country as the result of the present well-meant efforts to save the lives of foundlings. As is well known the death rate among foundlings kept in large institutions is very high. When in addition to the risks of institution life there is artificial feeding, very few of the children survive infancy. In some places the state of affairs which developed was so dreadful that it well deserved the name invented for it by a caustic German physician, "Engelmacherei" (angel-making). In recent years, as the result of farming out infants to wet nurses the death rate among foundlings has been very materially decreased. As a matter of fact, according to some recent statistics there would seem to be less mortality among foundling children thus farmed out, than among the general run of the infantile population. We fear, however, that in this matter at least there has been some juggling with statistics, and that the figures given are those prepared for the purpose of producing an impression upon boards of charities, or legislative committees.

Now comes the interesting contrecoup to the decrease in foundling mortality. Those who are most closely in touch with the poorer classes of the population, mainly Italians, Bohemians and certain Russians and Germans, who now accept the care and wet-nursing of infants for a consideration, have been led to the impression that at times not sufficient care is taken of the children of the family itself, there being a definite knowledge that in case of the death of their own infant, the mother will be able to add quite an important increment to the monthly wage of the family by acting as a wet nurse for a foundling. This seems an entirely inadequate motive to suggest for a maternal neglect of her own child, especially by a woman only recently become a mother and as yet nursing. This is, however, just exactly the state of affairs that was found to exist in England as regards infantile insurance in cases where there was even less money involved. When infants are sickly and require a great deal of care, it is rather easy for a mother to neglect them sufficiently for death to take place, yet without absolutely resolving that she will shorten the life of her child. When then there is the additional motive that she will have another infant to care

for and be well paid for it, neglect may very readily take place.

It seems sure that the mortality among foundlings adopted by poor families is less than that among their own children. This, however, has been claimed to be due to the fact that when foundlings are placed in a family the family is in many cases visited regularly by a trained nurse who suggests to the foster mother the various precautions necessary to preserve the health of the child, or the infants must be brought for regular examinations when suggestions are made. It is understood, too, that in case the foundling does not do well in the family it will be taken away. This regulation especially is said to act as a wonderful help in securing the exercise of due care for the child. It seems unfortunate that some of this helpfulness of modern science cannot be exerted for all infants as well as the foundlings, but thus far it has been difficult to secure proper attention to advice with regard to such matters.

It would seem that some of this experience with regard to the foundlings and their presence in families may of itself have a highly educative value in bringing up mothers to the proper recognition of up-to-date methods in the care of their own children that will eventually compensate for the increased mortality now apparently due to the prospect of having a foundling to care for and being paid for it.

This is the most hopeful feature of the present outlook. The system established by the former Commissioner of Charities in New York City for the care of our foundlings has undoubtedly done very great good and saved many infantile lives. The problems in sociology, however, which it has brought up are deserving of careful study and will prove a fruitful source of material for the development of significant ideas with regard to the improvement of the condition of the poor.

SURGICAL TREATMENT OF PYLORIC CARCINOMA.

ALTHOUGH it is now twenty-five years since Rydygier, with marvelously bold stroke, first removed the stomach for malignant disease, and despite the fact that hundreds of variously designed resections have since been successfully accomplished, the fact remains that the percentage of deaths from gastric neoplasm is steadily increasing.

The efforts of the surgeon have in no way kept pace with the dread and unknown increment factor of this disease. This has led to continued effort on the part of abdominal surgeons to devise a means of meeting this increment by operative procedures less fatal and more effective than the early technics.

In the March number of the *Annals of Surgery* W. J. Mayo outlines a technic which, in his skilled hands, has yielded such admirable results as to justify the belief that a welcome light has been cast on this dark and difficult problem.

Mayo is convincingly explicit. He declares that temporizing with laboratory methods is a futile and dangerous waste of time; early exploratory incision being positively the only method suited to surgical diagnosis. He emphasizes his already reiterated belief that many gastric carcinomata spring from the bed of ill-healed ulcers. Best of all he negatives the dictum that was taught and believed for many years that the presence of a tumor of itself demonstrated inoperability. This, he holds, is by no means true. A small movable tumor in the pyloric region may be a favorable indication, it having been observed that patients with marked symptoms of gastric carcinoma but without any evidence of pyloric obstruction, prove on exploration to be the victims of advanced and hopeless disease. Early pyloric stenosis must, therefore, from now on, be regarded as a benignantly favorable expression of the malignant growth.

Eight months ago the author presented the technic of a composite operation which removed all save the dome of the stomach. Subsequent operations, in which he found the element of shock to be of considerable importance, led him to modify the technic until he now considers that he has found the desired medium between a minimum of shock and a maximum removal of the organ. This technic has been employed thirteen times with but one death.

Although the ultimate results of the operation are less encouraging by far than in those for the relief of mammary carcinoma, the condition is by no means hopeless. Kocher reports that no less than six of his cases have been well three years after operation, one after eight and the other after thirteen years being in the best of health. There is then, very emphatically, a *raison d'être* for trying.

The modification of Mayo's more radical operation seems to offer so much hope in a hitherto nearly hopeless condition that the technic cannot be too broadly circulated. It is only by continual iteration that the mass of the profession can be brought to a realization, at the present stage, at

least, that hunting for HCl and peering into foul-smelling pools of stomach contents for the elusive Boas bacillus, or cotton-bale yeast is nothing more or less than a gentlemanly way of putting a quietus on the unfortunate patient. Let the surgeon explore.

It is not the part of radical surgery but of the most conservative, modern medicine to make this appeal. Mayo complains that it is *not* the patient or his friends who turn aside the exploring knife but, in almost every case, the attending physician!

FACIAL NEURALGIA.

PROBABLY no class of cases is more pitiable than those of the patients who come complaining of severe paroxysmal facial neuralgia, for which ordinary drugs give no relief. In the last twenty-five years at least a dozen different operations, each one of them more severe and more dangerous and presumably more radical than its predecessor, have been devised for the purpose of curing such neuralgias. All the various nerves of the face have been divided farther back at each successive operation until finally even the skull has been opened and the Gasserian ganglion removed. Needless to say this is an extremely dangerous operation. Even in the hands of experienced surgeons many patients have perished from it.

Very few physicians in practice in our large cities have failed to see some of these cases in which a number of operations have been done, each one affording relief for some time, but always followed by recurrence of the painful attacks. Even the removal of the Gasserian ganglion has not proved absolutely curative in a certain number of cases, and patients with marks of having had a large osteoplastic resection of the skull performed are still going to clinics complaining of their awful attacks of pain in the face. Usually they become the victims of the morphine habit, but even morphine fails to give relief after a time, and the coal-tar products are abused to an awful extent by them. Some few of these cases have yielded very surprisingly to quinine. Whenever there is a regular interval between the attacks of pain no physician or surgeon should think of recommending an operation until quinine has been tried. Even when the paroxysms come irregularly, if there is a history of the patient's having had malaria, quinine must be tried over long periods.

These cases constitute one of the most serious opprobria of modern medicine and surgery. It is extremely interesting, therefore, to find a new possible explanation of the origin of the pain and relief afforded by another form of treatment, which by no means involves very serious operation. At the last meeting of the Medical Society of the State of New York, Dr. Sargent F. Snow, of Syracuse, reported a series of cases of tic douloureux and other facial neuralgias which had been cured by treatment of the intranasal structures and of the accessory sinuses of the nose. In the discussion, Dr. Roe, of Rochester, said that his own experience confirmed that of Dr. Snow, and he felt sure that in most cases relief would be afforded by proper intranasal and auxiliary treatment. As in some of these cases serious operations upon nerves had already been performed with only passing success, these suggestions deserve the attention of all those who have these unfortunate patients come under their observation.

It is not difficult to understand that pressure within the nose itself and within the accessory sinuses may very well set up a very obstinately intractable form of paroxysmal pain. Extremely delicate nerve endings are pressed upon by fluid collections under pressure, and the result is sure to be painful nerve explosions. Whether these pathological conditions associated with the nose and its sinuses will explain all of the cases of tic douloureux remains to be seen. They certainly do include, however, a good many cases formerly thought to be facial neuritis of some form, and the apparently more enduring relief that can be afforded under the new and more correct diagnosis is of itself sufficient to make this a noteworthy advance in medicine, if further experience will confirm the observations so far reported.

ECHOES AND NEWS.

NEW YORK.

Examinations at Brooklyn Hospital.—At the examination held at Brooklyn Hospital for the appointment of four new internes, the following men from the College of Physicians and Surgeons were successful: First place, W. H. Lohman; second, J. T. Rose; alternate, F. H. Wilson. The third place was taken by a Syracuse student, and the fourth by a Bellevue man.

Dates for Hospital Examinations.—A partial list of the hospitals in this city which will examine applicants for interneships during March and April, are appended: German Hospital, March 21; Bellevue, March 24, 25, 26; Mount Sinai, March 24, 25; Methodist Episcopal of Brooklyn, March 26; Post-Graduate, March 28 and 29; the German Hospital and Dispensary, March 31; S. R. Smith Infirmary, April 1; Lying-in, April 4; St. Luke's and Presby-

terian, April 4 and 5; City, April 5; Roosevelt and New York, April 11; St. Joseph's, April 12; Ruptured and Crippled, April 13; General Memorial, April 14; Gouverneur, April 18 and 19; St. Francis', April 19; Lincoln, April 19 and 20.

Proposed Change in License of Dogs and Cats.—Assemblyman Ellis, on March 15, introduced in behalf of the New York City administration a bill transferring from the Society for the Prevention of Cruelty to Animals to the City Health Department all jurisdiction over the licensing of cats and dogs in the City of New York. The bill was prepared under the direction of Dr. Darlington. It is to be supported by arguments citing the growing belief that the suppression of the vagrant dog and cat nuisance in cities is a matter more vital to the health of the people than it is from the viewpoint of cruelty to the animals, and that contagious diseases are believed to be carried from house to house by cats.

Plan to Combine Dispensaries.—An adjourned meeting of the Board of Surgeons of the New York Eye and Ear Infirmary was held last Saturday at the Infirmary, corner of Second Avenue and Thirteenth Street, when the committee of three, composed of Drs. P. A. Callan, D. W. Hunter, and W. E. Lambert, appointed at last Thursday's meeting to inspect the Gouverneur Hospital reported to the Board of Surgeons. The committee spent Friday afternoon going over the trachoma pavilion, or contagious diseases of the eye wing, of the Gouverneur Hospital, with a view of determining whether it will be possible for the city's cases to be taken over by the New York Eye and Ear Infirmary. Through Dr. Brannan, representing Dr. Darlington, the Health Commissioner, overtures were made to the Board of Directors of the New York Eye and Ear Infirmary, with a view to closing the trachoma ward at Gouverneur Hospital, and sending the city's cases to the infirmary, to be treated in the Platt pavilion, which was closed on March 1 last. If the work can be done by the Infirmary for $15,000 or $18,000, it is possible, according to a statement by the Board of Surgeons, for the work to be done at the infirmary. If the city can agree to pay a reasonable sum for the work, annually, the closed Platt pavilion, which is operated only under heavy expense, will be reopened at once to meet the demand for treatment of the school children suffering from trachoma. A woman, who desired her name withheld, has sent a check for $500 to John L. Riker, treasurer of the Infirmary, with her best wishes for the success of the work.

Manhattan Dermatological Society.—This society held its regular meeting on March 4, 1904, at the residence of Dr. Weiss; Dr. Oberndorfer, presiding. Dr. Gottheil presented case of gumma of conjunctiva of right lower eyelid. Diagnosis accepted universally. He also presented a case of epithelioma of tongue in male, six to seven years' duration, excision of nodule on tip of tongue years ago; recurrence on right side posteriorly; ulcer with hardened base. Dr. Weiss advises removal of jagged teeth in conjunction with ordinary treatment.

Dr. Oberndorfer presented boy with pemphigoid eruption on face. Patient when presented to this Society before had well-marked bullous lesions; now only more or less diffused erythematous spots to be seen.

In the absence of Dr. Ochs Dr. Gottheil presented a woman with maculosquamous syphilide on upper lip, chin and margin of hair and forehead. Child of woman, six years of age, has a very similar lesion on the right side of upper lip; child well-nourished and no other symptoms. Unanimous agreement that mother's lesion is syphilitic; Dr. Gottheil considers child's lesion syphilitic also. Dr. Moses had made histological examination of scales on child's face for the purpose of excluding trichophyton; no fungus found. Dr. Weiss considers lesion in child a simple non-syphilitic eruption; Drs. Cocks and Oberndorfer agree in the main with Dr. Weiss.

Dr. Gottheil presented a child, two months old, with syphilis congenita and eczema intertrigo, of seven weeks' duration; Drs. Oberndorfer and Moses agree to diagnosis made; Dr. Pisko considers lesion psoriasis; Dr. Weiss excludes syphilis at first but subsequently alters his opinion so as to consider syphilis a possibility.

Case presented by Dr. Gottheil for Dr. Ochs. Woman with macular eruption on chest and sides, which at one time looked very much like a pityriasis rosea. Has had eruption off and on for two years, and syphilis has at various times been thought of. Dr. Weiss, after taking into consideration the generalization, scaliness, long duration and absence of concomitant luetic symptoms, diagnoses seborrheic eczema; others present concur.

Dr. Gottheil presented a woman, who had already been presented as case of lichen planus corneus. Papules now principally on wrist. He also presented a case of bromoderma. Pustular, acne-form leg and thigh lesions.

Dr. Pisko presented a woman with a characteristic case of lupus erythematosus. Left side of face had been swabbed with formalin, causing severe pain and a new crop of lesions; one application of trichloracetic acid with good result on right side; must be applied gently.

Dr. Weiss presented a woman with lupus erythematosus; Dr. Cocks thinks morphea exists on right side of face also.

Dr. Gottheil reports four cases treated with Finsen ray and three cases cured and not yet relapsed. Some cases look at times like seborrhea, at other times they look like lupus erythematosus. Dr. Moses found the Finsen light useful or curative in a large number of cases at the Finsen Institute. In one very severe case in a man, he observed an almost perfect result from painting the lesions with tr. iodi and the use of quinine internally; Dr. Weiss agrees generally with suggestions made.

Dr. Pisko showed a typical case of psoriasis; well-marked and with typical course.

Dr. Weiss presented a case in a middle-aged woman; the lesions consist of small, red papules on axillary folds and on abdomen and which he designates provisionally as lichen ruber acubus. Dr. Cocks considers that it could be grouped among the eczemas, but Drs. Pisko, Gottheil and Jacobson agree in the main with Weiss, although claiming it as a lichen simplex and advise further study, both histologically and clinically before definitely classifying it under a special rubric. Dr. Moses proposes to excise one of the lesions for histological examination.

Dr. Moses presented a case of multiple syphilitic infection in a young married man. Patient presents a typical indurated urethral chancre one-fourth inch posterior to meatus; also an indurated subcutaneous nodule in scrotum, immovable and firmly attached to epidermis. The latter has been extirpated for histological examination, and in healing the operation wound has reindurated. The scant secretion from urethra on microscopical examina-

tion shows the absence of pus cells and gonococci; numerous bacteria and cocci are present. The histological examination of scrotal lesion has not been completed; also two lesions on corona glandis. Two crusted ulcerations exist on right forearm, which simulate both a serpiginous syphilide and a simple impetiginous eruption. Dr. Gottheil diagnoses multiple syphilitic infection; possibly a quadruple infection. Dr. Cocks considers the lesions on arm gummatous, and those on corona glandis serpiginous syphilides; in regard to lesion in meatus he requires further observation before making diagnosis. Dr. Weiss considers lesion on meatus as undoubtedly an initial sclerosis, although the absence of glandular involvement is remarkable.

Dr. Oberndorfer presents a man with lichen planus. The patient is also afflicted with an artificial dermatitis which he considers as due to having worn an undershirt from a deceased friend, and presents many new scratch lesions; the latter lesions are of three weeks' duration.

PHILADELPHIA.

Leper to Be Returned to Hawaii.—An Hawaiian leper has been discovered in this city after living here for three weeks. He sought treatment for blotches on his skin, this leading to the diagnosis of leprosy. It is said that the man will be returned to join the leper colony in Hawaii.

Smoke Ordinance Adopted.—City Councils have passed a smoke ordinance, to go into effect next October. The bill does not include all that its promoters desired, but it is at least a beginning toward a less vitiated atmosphere. The standard fixed by councils is the regulation color scale of two densities and the limitations of the various smoke-producing establishments have been specified. A fine of $25 is to be paid for each failure to comply with the requirements.

Epidemic of Measles.—There are more than 3,000 cases of measles now under treatment in Philadelphia, and during the past week 17 children died from the disease. Physicians say they have found more serious results from measles during the past winter than are usually met with in cases of scarlet fever. This is considered largely due to the fact that greater precautions are usually observed in connection with the latter disease, measles being looked upon as an exceedingly mild and comparatively inoffensive infection. With the present epidemic this is not true and parents are being advised to call a physician at once when the attack begins.

Philadelphia Hospital Residents.—Considerable apprehension is being felt by the students of certain of the medical colleges of the city regarding this year's Philadelphia hospital appointments which are looked upon as among the most valuable hospital positions open to Philadelphia graduates. This feeling is due to the fact that equal representation among the three larger colleges, with a certain number of representatives from the Woman's Medical College, is to be abolished and the appointment made according to standing in an examination soon to be held. This sounds fair enough and a strictly impartial examination is promised by those in authority; nevertheless there is a quite general opinion that politics will sooner or later again have much to do with the appointment of internes.

High Death-rate Since January 1.—From January 1 to March 19 this year the deaths from all causes have been 7,983, this being 1,761 more than during the corresponding period of 1903. Deaths from pneumonia lead the list with 1,227, the second being tuberculosis with 704 deaths. Measles has helped swell the rate by furnishing 93 of the fatal cases, as against 25 during the first three months of 1903.

Dr. Maragliano Ill.—Owing to the illness of Dr. Edoardo Maragliano, of Genoa, Italy, he will be unable to deliver his address on Tuberculosis, under the auspices of the Phipps Institute, which was scheduled for March 28. Dr. Maragliano has, however, authorized Dr. Lawrence F. Flick to read his address on that evening.

CHICAGO.

Talks on Nervousness.—During the coming summer an interesting course of lectures for teachers and graduate nurses will be given under the auspices of the Chicago Hospital School for nervous and delicate children. The lectures will cover the field of work with defective and abornmal children. Among the physicians who will lecture are Dr. Daniel R. Brower, Dr. Archibald Church, Dr. Henry B. Favill, Dr. Hugh T. Patrick, Dr. Eugene S. Talbot, Dr. H. V. Halbert, Dr. N. B. Delameter, Dr. Harold N. Moyer, Dr. Truman W. Brophy, Dr. Frank Billings, Dr. W. S. Christopher, Dr. Frank Allport, Dr. Julia Holmes Smith. A number of specialists from other cities will also present interesting phases of the work. The complete program will probably be in readiness about the middle of April. During the last two years the school has had a large correspondence class of teachers, and it is the aim of the institution to make it possible for these outside teachers to come together for the discussion of their problems and to have presented to them from the physician's point of view the most scientific methods of handling such children. The course is open to parents as well as teachers.

Iroquois Hospital Plan.—The proposal of the Iroquois Memorial Association to establish an emergency hospital in the business district in memory of the victims of the theatre fire has been indorsed by the Chicago Medical Society. The action of the society was embodied in a resolution presented by Dr. Andrew M. Harvey and seconded by Dr. W. A. Evans. The preamble lays stress on the need of a hospital in the heart of the city and the resolutions continue: "Resolved, That the Chicago Medical Society approves the action of the trustees of the Iroquois Memorial Emergency Hospital in their generous effort to give to the people of Chicago a modern, fully equipped and endowed hospital capable of rendering prompt assistance to those cases of unexpected injury and sickness, which are of daily occurrence, and be it further resolved, that we, as a society, tender to the hospital our counsel, advice, and professional service whenever required."

Another National Anti-tuberculosis Association.—To prevent tuberculosis by legislation and through a campaign of education is the object of an organization incorporated in Springfield recently under the name of the National Anti-Tuberculosis Association. The incorporators are Dr. W. B. Metcalfe, Rev. F. M. Carson, C. W. Hanford, Alderman W. M. Butterworth and Walter R. McDonough, all of Chicago. According to the incorporators the association is purely philanthropic. They expect to enlighten the public through lectures and publications and to urge several important legislative measures that will check a spread of the disease. There is not a tuberculosis clinic in Chicago, and they mean to establish one in the downtown district as soon as possible. Several doctors are interested in the association and the list of directors will show a large number of the prominent business men of the city. A campaign of education and for better legislation is needed to protect families. In the way of legislation the most

apparent need is a registration of patients suffering from tuberculosis. In the Eastern States there is such a registration and it has done great good. A hospital for the treatment of the disease may be established later.

Order of St. Joseph to Erect Hospital.—Plans for the Hotel Dieu, a religious hospital to be built for the Hospitalers of St. Joseph, who came here from Kingston, Ont., have been prepared by Architect George A. Beaudry. The building will be erected at the corner of Harvard avenue and Sixty-fourth street, and will be four stories high, covering an area of 165 by 175 feet, and be of fireproof construction. The exterior will be of Bedford stone, with tiled mansard roof, above which will rise an ornate dome 68 feet high. In the halls there will be enameled brick wainscoting with marble and mosaic work, and the building will embody all the improvements that go to make up a first-class hospital. The cost is estimated at about $200,000. This, however, will be but a part of the building, which, when complete, will have a frontage of 225 feet and a depth of 175 feet. Rev. Bernard P. Murray, pastor of the St. Bernard's parish, will have charge of the building.

Consumption and Pneumonia.—The Chicago *Tribune* under date of March 12 has the following to say with reference to these two diseases: "In the United States in 1899, 105,971 people died of pneumonia as against 109,750 who died of tuberculosis of the lungs. As comparative numbers they stood appallingly close together. But even in the matter of human life there may be economic differentiation. Economically it is a fact of tremendous significance that 33,807 of the victims of pneumonia were under two years old. Human lives, it is true; infants which might have had vital bearing upon the future of society and State. Yet from the economist's point they were physical weaklings upon which little had been spent. But what of tuberculosis? It is of inconsiderable peril until the age of ten years. Between the ages of fifteen and nineteen years, however, its black shadow has eclipsed that of pneumonia, and between the ages of twenty and twenty-four years it has reached its maximum in 16,031 deaths in one year. Human lives? Yes, lives that are just equipped for the beginning of life and living—lives upon which the maximum has been spent in preparing for life. For 1899 the census showed 24,905 deaths between five and forty-five years from pneumonia as against the 72,960 from tuberculosis. At the flood tide of life phthisis takes three times as many people as pneumonia. But of the 24,905 victims of pneumonia there are other facts of vital bearing. Broadly speaking, the victim of pneumonia is a weakling. The reports of the census show that from fifty-five to seventy years there is an increase in deaths from pneumonia with a more than corresponding decrease from tuberculosis."

Inspection of School Children.—The Board of Education of Chicago through Dr. Henry Hartung has formulated the following routine for the examination of school children: *Eyes.*—Diseases of the conjunctiva and lacrimal apparatus, muscles of the eyeball, visual acuity, hypermetropia, myopia, astigmatism. *Ears.*—External ear, auditory meatus, drum membrane, hearing, acute or chronic diseases of middle ear. *Mouth and Pharynx.*—Defects of tongue, lips, palate, condition of teeth, hypertrophy of tonsils, pharyngitis, adenoids, granulations, etc. *Nose.*—Acute or chronic rhinitis, nasal hypertrophies, polypus, deflection of septum, etc. *Chest.*—Abnormal development, round shoulders, spinal deflection, diseases of the heart and lungs. *Skin.*—Acute or chronic affections, scabies, pediculosis, favus, etc. *General Nutritional and Structural Disorders.*—Anemia, chronic headaches, glandular enlargement, tuberculosis, deficiency of muscular development, nervousness, chorea, or any pathological condition which may retard the pupil's growth or influence his progress in school work.

Treatment of Bronchitis, Bronchopneumonia and Pneumonia in Children.—In a paper on this subject, read before the March meeting of the Chicago Pediatric Society, Dr. James Warren Van Derslice stated that in many children there was a tendency toward catarrhal inflammations of the air passages. How to remove this tendency was a hard problem. No amount of cod-liver oil and tonics would overcome this predisposition without good hygiene. The temperature of the rooms was kept too high; the temperature of living rooms should be 68° to 70° F. Children should be accustomed to outdoor air. This should be begun in the summer and continued throughout the year except in case of a storm, when the child should be dressed for outdoors and taken in a room, with windows wide open, for twenty minutes to half an hour. Cold sponge bath of the chest and arms every morning was of value. The child's underclothing should be of wool, the lightest weight in summer, and only medium in winter. Chest protectors should be discountenanced. Care must be taken that the feet are kept warm and dry. The mistake in dressing the child was almost always on the side of too much rather than too little clothing. The sleeping room should always be supplied with fresh air, and the child should sleep in flannel night-clothes. The sending of patients to a warmer climate during the winter season was necessary in a few cases, but he believed the majority of them did better in a dry cold climate. He discussed the general management of these cases, and then spoke of the value of inhalations of steam, saying they were not sufficiently appreciated. These were best given in a tent by placing medication in a quantity of boiling water, as the use of lamps in a tent deoxidized the air too much. Three quarts of boiling water in an earthen vessel would produce steam for ten minutes, which was about the length of time these inhalations were usually given. They should be given every two to four hours. Simple lime water inhalations were the best; later creosote, pine needle oil, compound tincture benzoin, terebene, turpentine, camphor, oil of eucalyptus, or eucalyptol might be used. Internal medication should be entirely symptomatic. The indications for treatment, in the main, were nutritional, stimulant and hygienic.

Thoracic Difficulties of Childhood Exclusive of Cardiac; Differential Diagnosis.—Dr. S. V. Balderston urged a closer study of the physical signs in thoracic disease of children. Auscultation alone is not sufficient. Pile-driver percussion is not suited to the child's chest. In these conditions, dyspnea, cough, cyanosis and nervous manifestations may be called cardinal symptoms. One should study the conditions within the air pasages and cavities which prevent free admission of air or cause irritation; also the conditions in the lungs and chest walls. Finally, the reflex and central conditions should be carefully studied. He divided the subject into two groups: (*a*) acute, and (*b*) chronic. Croup was used as a comprehensive term to include a variety of conditions in which there is a tendency to spasm of the glottis. Enlarged tonsils and adenoids are usually present; as an inciting cause catarrhal spasm of the larynx may be confused with acute bronchopneumonia at the outset. History of afternoon hoarseness, amenability to antispasmodics, and return of attack the following night indicate catarrhal spasm. Laryngismus stridulus is excluded in which there are periods of complete cessation of respiration. Acute bronchitis. (*a*) Simple; (*b*) severe, and (*c*) capillary bronchitis. (*a*) In mild cases the question is whether it is merely a

complication of another disease. (*b*) Onset of severe bronchitis cannot be differentiated from pneumonia. Exaggerated, not bronchial, breathing observed all over the chest. Any impairment of resonance or suggestion of bronchial breathing excludes bronchitis. (*c*) Capillary bronchitis, no attempt is made to differentiate it from bronchopneumonia. Pneumonia. Bronchopneumonia signifies a low resisting power. It presents the symptoms of a mixed infection. At the onset there was marked prostration and cyanosis; variable temperature, very high or very low. There are indefinite areas of consolidation and bronchial breathing, marked dyspnea, great mortality. In lobar pneumonia the physical signs are all-important; there is the most difficulty in central consolidation. The physician should watch for bronchial fremitus. The characteristic signs were defined area of dulness and bronchial breathing. Chronic conditions. Here it is a question as to whether or not there is infection by the tubercle bacillus. In cases of chronic cough and chronic pneumonia following pertussis and measles, *Bacillus tuberculosis*, enlarged tonsils and adenoids may serve to keep up the cough. Enlargement of the bronchial glands irritates the recurrent laryngeal. This enlargement may be tuberculous or not. In children tuberculous infection of the lungs probably starts from the center through infection from these glands; hence there is rarely infection of the extremes of the lung. Cavernous breathing and cracked-pot sounds do not indicate cavity, but consolidation about a bronchus. The family history should be carefully investigated, likewise the surroundings, also for foci in other parts of the body.

GENERAL.

State Manufacture of Antitoxin in New Jersey.—Dr. F. C. Henry, a practising physician in New Jersey, has introduced a bill in the legislature of that State recommending the building of a plant for the wholesale manufacture of diphtheria antitoxin. Dr. Henry's bill provides as follows: "1. The State Board of Health shall provide such laboratory or laboratories, apparatus, materials, and other requirements necessary to make or prepare and distribute diphtheria antitoxin to the inhabitants of the State. 2. The State Board of Health shall make or prepare and distribute without charge, in sufficient quantities to supply the inhabitants of this State, diphtheria antitoxin in such manner through local boards of health, or otherwise, as the said State Board of Health shall by rules determine. 3. This act shall take effect immediately."

The bill is endorsed by the State Board of Health, which has plenty of facilities for making antitoxin. The measure was referred to the Judiciary Committee and it will probably soon be reported and rushed through.

Massachusetts is said to be the only State of the Union which at present owns and controls its antitoxin laboratories.

Canal Site a Pest Hole.—In a report to the Government upon sanitary conditions in Panama, Dr. Claude C. Pierce, assistant surgeon in the service, says that the climate there is likely to prove a menace to all American visitors for some time to come. No isolation of infectious diseases is compulsory, and their prevalence in that region is well known to everyone. Leprosy is more or less common in Panama city, along the Panama railroad, and in the country districts. Beriberi has been common since 1897, and there are now thirty cases in the French hospital in the above-named city. At present there are very few cases of smallpox, because provision has been made for a general free vaccination. The other diseases commonly seen are tuberculosis, dysentery, elephantiasis, yellow fever and estivo-autumnal malaria. Dr. Pierce says that the climate at the isthmus "practically prohibits efficient work, and would lead to a wanton sacrifice of human life impossible to estimate were American laborers sent there in large numbers."

Physicians in Demand.—The German and Russian governments have prevented the holding of the Tenth Congress of Polish Physicians and Scientists, which was set to be held at Lemberg, Austria, July 2 to 24, 1904, as their presence is desired at home.

Meningitis in Malone.—This town has been suffering from an epidemic of cerebrospinal meningitis the past two weeks, and eight deaths have resulted. As the disease has been confined solely to school children, the Board of Education, at a meeting this week, voted to close the schools until such time as the epidemic is checked.

Hospitals under Construction.—According to *Charities*, nearly a million and a half dollars is now being spent, or is about to be spent, in some nine different States for new buildings for the insane. This is exclusive of New York State, where between $600,000 and $900,000 is annually expended for this purpose. It would seem pertinent to inquire whether there might not be an increase in efficiency and decrease in cost if the experience of the different States were in some way made available to one another. We have practically the same classes of patients to be provided for in all cases, and there is little reason why buildings which have been found suitable in Massachusetts should not be suitable in Oregon. The building operations now under way, or already planned, include entirely new institutions at Norwich, Conn., Allentown, Pa., and Parsons, Kansas, and additions to existing buildings at Norristown and Harrisburg, Pa., Spring Grove and Sykesburg, Md., Dunning and Watertown, Ill., Lyons View, Tenn., Hopkinsville, Ky., San José, Cal., Eloise, Mich., Las Vegas, New Mexico, Norfolk, Neb., and Pineville, La. The buildings include administration buildings, nurses' homes, cottages for convalescents and buildings for almost all other classes of patients. These buildings are probably designed in most cases by architects who have little familiarity with the requirements of the insane or with expert opinion on the subject of their accommodation. It is not customary for architects to specialize on institution construction, and the appointment of an official State architect has probably never been considered in most cases. Problems which have been solved only after many failures in some of the older States are, perhaps, worked out afresh without adequate data. In 1891, William P. Letchworth, a member of the New York State Board of Charities, wrote a valuable paper on "Poor-house Construction," which was transmitted by the State Board of Charities of the legislature and was afterward reprinted and circulated for the information of the public. How helpful it would be if some expert in hospital construction would prepare a treatise on the construction of institutions for the insane, illustrated with plans and elevations and equipped with references to localities where successful exponents of sound theories of construction could be seen and studied.

London Medical School Endowed.—Sir Donald Currie has given $500,000 to the University College and London University. It is intended with this sum to build a school of advanced medicine, and it will also enable the university to incorporate the college in its system.

X-ray Anniversary.—It is announced that in 1905, the tenth anniversary of Roentgen's famous discovery of the X-rays, a Roentgen celebration will be

held in Berlin. This will include an exhibition of Roentgen apparatus, and persons desiring information regarding the arrangements should communicate either with Prof. R. Eberlein or Dr. Immelmann, of Berlin.

Iowa Hospital for Drunkards.—The Iowa State Senate on March 18 voted an appropriation of $125,000 for the location at Knoxville of a hospital for habitual drunkards. This is the first open approval of Iowa's so-called "dipsomaniac law." This law, which went into effect two years ago, has been severely criticized.

The Plague at Pretoria.—The bubonic plague has appeared here, but is well in hand and is confined to the coolie population. There has been one death.

OBITUARY.

Dr. THOMAS MCINNES, Senator from British Columbia, and subsequently Lieutenant-Governor, died at Vancouver last week. He was a pioneer in British Columbia.

Dr. JAMES BROWNLEE SANFORD, Speaker of the Colorado House of Representatives, died at Denver last week of appendicitis, aged thirty-five years. He was born at Penn Yan, N. Y.

Dr. MOREAU MORRIS died last week at his home in East Seventeenth street, this city. He was born at Stillwater on June 19, 1825, and was graduated in 1848 from the College of Physicians and Surgeons. In 1866 he was appointed health commissioner, and from 1870 to 1872 served as superintendent of the New York City Health Department and State cattle commissioner. In 1871 he became surgeon of the Seventh Regiment, N. G., S. N. Y., and served until 1884. Immediately following his retirement from the National Guard he was appointed tenement house commissioner. Dr. Morris was a member of the Seventh Regiment Veteran Association, of the American Public Health Association, of the Alumni of the College of Physicians and Surgeons, and of the Academy of Medicine.

Dr. WILLIAM FREDERICK HOLCOMBE, for many years one of the most distinguished physicians in New York and a noted specialist on diseases of the eye and ear, died suddenly last week in the Presbyterian Hospital, after a brief illness, from a general breakdown due to old age. Dr. Holcombe lived for years at No. 54 East Twenty-fifth street, and treated General Grant during his last illness. He also treated Daniel Webster and Charles Sumner. Some ten years ago he became deaf, and through this affliction was compelled to give up his practice, as well as his professorship on diseases of the eye and ear in the New York University Medical College, the New York Ophthalmic College and Hospital, and the New York Medical College for Women. He was born in Stirling, Mass., April 2, 1827. Dr. Holcombe was one of the founders of the New York Genealogical and Biographical Society and was a member of the International Medical Association.

Dr. FRANK K. IRVING, electrotherapeutist of the City Hospital at Newark, N. J., died in that institution last week of tuberculosis to which he subjected himself in his search for a means of curing that disease by reaching the germs with the electric current and forcing a mineral solution through the tissues to the affected parts. Dr. Irving was thirty-five years old and was born in Fort Wayne, Ind.

Dr. THOMAS W. WATKINS died last week at his home, 453 Forty-second street, Brooklyn, in his seventy-sixth year. He was a son of the late Dr. John Watkins of London, England, who was among the first to use chloroform in medical practice. The son came to this country thirty-five years ago and settled in Brooklyn.

CORRESPONDENCE.

OUR LONDON LETTER.

(From Our Special Correspondent.)

LONDON, March 3.

ROYAL VISIT TO CAMBRIDGE—INDISPOSITION OF THE KING—HEALTH OF THE BRITISH NAVY—LORD NELSON'S LOST ARM—PREJUDICE AGAINST LADY DOCTORS.

ON March 1 the King and Queen visited the University of Cambridge for the purpose of formally opening the new museums and laboratories now approaching completion. It is fifty-six years since a reigning sovereign has shed the light of his material countenance on the ancient seat of learning that lies among the sedges of the Cam, and the visit was made the occasion of a display of exuberant loyalty which among the undergraduates took the form of rowdiness and "ragging." The King wore the scarlet robes and quaint hat of a Doctor of Laws. It may be mentioned by the way that His Majesty's academic millinery is almost as varied as that of his Imperial nephew of Germany is in the way of military uniforms. King Edward, besides his Cambridge doctorate, is a D.C.L. of Oxford, a LL.D. of the Universities of Glasgow, Dublin, Calcutta and Wales, and a Doctor of Music of the Royal University in Ireland. It may be added that he is an Honorary Fellow of the Royal Colleges of Physicians and Surgeons, having in each of these capacities the privilege of wearing special raiment of a more or less decorative character. He was himself a student, both at Oxford and at Cambridge and to Trinity College in the latter University he sent his eldest son, the late Duke of Clarence. In the Senate House the King made a little speech which—it may be mentioned for the information of a certain New York specialist who made a confident diagnosis of laryngeal cancer on no better foundation than the huskiness of the royal voice—was delivered in clear, strong tones. One passage was specially significant. He declared that he earnestly desired the extension and development of all branches of study and research, and he foretold that Cambridge would continue to occupy a foremost place in this great work. He spoke, too, of the new endowments of education which were necessary if it was to be kept up to its proper standard of efficiency. It is to be hoped that this hint from the King will bear fruit, for it is difficult to get the British public to see that such endowments are required. Their view of education is that expressed of literature by William Pitt. When that statesman was asked to grant a pension to a meritorious man of letters, his reply was "Oh, literature can take care of itself!" The new buildings of the Cambridge Medical School will add considerably to its efficiency. It is already the largest school of medicine in England, but the teaching has hitherto been crippled by the want of laboratories and equipment.

The day of the royal visit to Cambridge was bitterly cold and it was noticed by some of those present at his reception that the King's face was almost cyanotic and his breath very short. He has to a large extent regained the Falstaffian girth which he partly lost after the operation. He has greatly aged within the last year or two, and his general appearance is that of a man whose constitution is undermined. To-day it is announced that he caught cold at Cambridge, but the indisposition is said to be slight. There can be little doubt, however, that from an insurance point of view he is a "bad life."

The Statistical Report of the Health of the Navy for the year 1902, which has just been issued, shows that with a personnel increase by 1190 as compared with the previous year, there has been an increase of

cases of sickness and deaths; on the other hand there has been a decrease of invalidings. The following are the figures:

Year.	Cases.	Deaths.	Invalidings.
1902	85,769	590	2,985
1901	84,026	526	3,108

The total force serving afloat in 1902 was 99,600, so that the aggregate number of cases of disease and injury recorded in the year furnishes a ratio of 861.13 per 1,000, which shows an increase of 7.3 per 1,000, as compared with the ratio for 1901, but a decrease of 22.2 when contrasted with the average of the last five years. The average number of men sick daily was 3,523.39, giving a ratio of 35.37 per 1,000, and showing a decrease of .02 per 1,000 compared with 1901, and of 1.71 in comparison with the last five years' average. The total days' sickness on board ship and in hospital was 1,286,038, which represents an average loss of service from disease and injury of 12.91 days for each person, which is the same as the preceding year, and a decrease of .6 in comparison with the average of the last five years. The total number of persons invalided was 2,985, which is in the ratio of 29.96 per 1,000, and shows a decrease of 1.62 per 1,000 when compared with 1901, and a decrease of 1.21 in comparison with the average of the last five years. Of the above total 2,666 persons were finally invalided from the Service, 200 of these refused surgical operation, giving a ratio of 20.74 per 1,000 for the whole force, or 69.21 per cent. of the number invalided, thus showing a decrease of 1.1 per 1,000 when contrasted with 1901. As regards the death rate, the ratio per 1,000 was 5.92, an increase of 0.58 per 1,000 compared with 1901, and a decrease of 0.29 when contrasted with the last five years' ratio. The highest death rate appears on the Pacific Station, viz., 67.42 per 1,000, due to the unfortunate loss of the Condor. There were no deaths on the Southeast Coast of America Station. Only two wounds in action are recorded, with one death. The prevalence of enteric fever and the mortality from that disease show a slight decrease. One case of plague, with a fatal issue, is reported from the East Indies Station. Cholera shows five cases with four deaths on the China Station. A decline in the ratio of cases of primary syphilis is shown, but there is an increase in regard to constitutional syphilis and also to gonorrhea.

An appendix to the blue-book, containing the report on the health of the Navy, gives a number of extracts from journals of medical officers of the Navy between 1793 and 1856. One of the most interesting of these is from the journal of the surgeon of the Theseus; it is dated "1797, July 24th and 25th," and is to the following effect: "Admiral Nelson. Compound fracture of the right arm by a musket ball passing thro' a little above the elbow an artery divided, the arm was immediately amputated and the following given him ℞ Opii. gr. ij. ft. Pil. statim. s., etc., 26 July. Rested pretty well and quite easy. Tea, soup, and sago. Lemonade and Tamarind Drink. 31 July. One of the ligatures came away; looks well. 1 Aug. Continued getting well very fast, stump looked well, no bad symptom, sore reduced to the size of a shilling." It may be remembered that Nelson received the wound for which his arm was amputated in a naval engagement off Santa Cruz. He bore the operation without flinching, but afterward declared that he had suffered much pain from the coldness of the surgeon's knife. This led him to issue an order that surgeons should always dip their knives in hot water before operating. The surgeon of the Theseus says nothing more about the case. The only further reference to it is found in the *Journal of the Seahorse*, wherein the surgeon, Mr. Thomas Eshelby, writes: "I was appointed from the Theseus, to attend the Admiral to England . . . . . one of the ligatures not come away. Twitching Pains at times, particularly by night. I gave the following: ℞ Haust. Salin. c. Tr. Opii. gtt xl. h. s. sumendus et rep pro re nata. Dress'd with Cerat Lap Calamin and dry Lint: he landed at Portsmo. 1st Sept. would not suffer the ligature to be touched." It is remarkable that the journal of Dr. Beatty, surgeon of the Victory, which is preserved in the Public Record Office, contains a list of the wounded at the battle of Trafalgar but is absolutely silent respecting the death of Nelson.

The medical profession in this country can furnish some of the most striking examples of fine old crusted conservatism to be found anywhere. When the proposal to admit women to the medical degrees of the University of London was first discussed, the late Sir William Jenner declared that he would sooner see his only daughter in her coffin than working in the dissecting room. He was the trusted physician of Queen Victoria and apparently believed that, although a woman could rule the State, she was unfit by some mysterious defect of nature to prescribe a dose of gray powder to a sick child. Afterward, when the University opened its doors to the ladies, Dr. Wickham Legg, then on the medical staff of St. Bartholomew's Hospital and author of a huge book on diseases of the liver, shook the dust of the University off his feet by resigning his degree; he has since devoted himself to the study of liturgy, which is presumably undefiled by the intrusion of women. Quite recently there has been an equally ridiculous exhibition of a prejudice which, it might have been thought, now existed only in a fossil state. A lady holding the highest professional qualifications was a short time ago appointed medical officer to the Western Infirmary, Westminster. She entered on her duties and gave great satisfaction to the poor patients among whom she worked. The result seemed fully to justify her appointment which was about to be made permanent, when Dr. Allchin, one of the honorary consulting physicians of the dispensary, sent in his resignation. He has been on the staff of the institution for thirty years and the governors found themselves in the awkward position of having to choose between retaining the support of the consulting physician or dismissing a competent and popular medical officer because the appointment of a woman was an outrage to the professional bigotry of the former. To the shame of the governors be it said they decided to sacrifice the lady. Their decision is the more extraordinary since the services of Dr. Allchin are now little more than nominal. He is a man of impetuous temper, who a few years ago threw up the post of Registrar to the Royal College of Physicians because he could not have his own way in some trumpery matter. For no better reason than to smooth the ruffled plumes of his susceptibility, the poor of Westminster have been deprived of the ministrations of an efficient medical officer. There is special need for a lady practitioner in the district. During the short period she has been in office her consulting rooms have been crowded every evening, and at the dispensary, where the patients are nearly all women and children, she was often preferred by those who could not consult a male doctor. According to her testimony there is a stronger feeling in favor of ladies among the poor than among the upper classes. Dr. A. E. Cope, who is also on the staff of the dispensary, has stated that the great bulk of the work of that institution was done among women and children, and having regard to the clientele there was plenty of room for a lady doctor on the staff. It is but fair to say, however, that such manifestations of obsolete prejudice as that just related are now quite exceptional here.

SPECIAL ARTICLE.

BYWAYS OF MEDICAL LITERATURE.—XX.

WILD ANIMALS AND DISEASE.

THERE are many who think that the wild animals are practically free from disease. Death is popularly supposed to come to them as the result of accident, or sometimes, but very rarely, as the consequence of old age. Very few people imagine that they are quite as subject to many of the diseases which make life unpleasant for human beings, as man himself. For instance, it is practically impossible to keep monkeys in confinement, unless the greatest care is exercised in preventing them from becoming infected with tuberculosis. At least three times in the last thirty years the monkeys in the zoological garden of Vienna have all died, as the result of tuberculosis. It is not alone in captivity either that animals are thus affected. Monkeys in their native wild woods are frequently found dead, having died from tuberculosis. It is even said that most of the carcasses of lions found in the desert of Sahara, contain evidence that the animal suffered during life from this disease, which is sometimes supposed to be the scourge only of insanitary living in crowded centers.

Those who imagine that animals do not suffer from even the minor affections that afflict human beings should read the article on the wild animal surgeon and his patients in the January number of *McClure's Magazine*. In these experiences of a veterinary surgeon, mainly occupied with the wild animals in the New York Zoological Garden, there are many stories of wild animals suffering from flatfootedness, from corns, from ingrowing toe-nails and from toothache. When animals suffer from toothache the affection is apt to be followed by abscess at the root of the tooth that often gives rise to blood poisoning and proves fatal. The same thing is true with regard to the ingrowing claws or nails, especially of the lions or tigers, which have to be operated upon in order to save the animal's life. Animals bear the suffering incident to these ailments very well until toxic absorption brings on a weakened condition, in which they become restless and uncontrollable. The whole subject is interesting as showing how comparative pathology enables us to explain the pathological conditions of the animals on exactly the same principles which form the basis of diseased conditions in human beings.

ANTIFAT CERTIFICATES.

In a story by the English humorist, Jerome K. Jerome, whose special genius allies him much more with American humorists than his English brethren of the farcical pen, there is an excellent description of how some of the certificates with photographs for antifat remedies are obtained. Every physician knows how difficult it is for both patient and physician satisfactorily to treat obesity, once it has begun to become a serious factor in life. The number of photographs that have been published then of people "before and after using" where success from some anti-obesity remedy seems assured, have been a source of no little mystery to the regular profession. The charlatans appear to succeed where the regulars fail. Mr. Jerome's explanation throws much light on the subject, however, and comes very near solving the whole mystery of the supposed efficacy of drugs that careful analysis has, over and over again, shown to possess no special merit as antifat remedies, being only simple familiar drug combinations, as a rule, little likely to correct a serious fault of metabolism.

Mr. Jerome introduces one of the principal characters in his story, "The Beginnings of William Clodd," in a recent number of *The Saturday Evening Post*, Philadelphia, in this way:

Mrs. Postwhistle sat on a Windsor chair in the center of Roll's Court. Mrs. Postwhistle, who, in the days of her hebehood, had been likened by admiring frequenters of the old Mitre in Chancery Lane to the ladies, somewhat emaciated that an English artist, since become famous, was then commencing to popularize, had developed with the passing years, yet still retained a face of placid youthfulness. These two facts, her youthful placidity in middle age and her generous rotundity, taken in conjunction, had resulted in an asset to her income not to be despised. The wanderer through Roll's Court this summer afternoon, presuming him to be familiar with current journalism, would have retired haunted by the sense that the restful looking lady on the Windsor chair was some one that he knew before. Glancing through almost any illustrated paper of the period, the problem would have been solved for him. A photograph of Mrs. Postwhistle, taken quite recently, would have been encountered with this legend, "Before Use of Professor Hardtop's Certain Cure for Corpulency." Beside it a photograph of Mrs. Postwhistle, then the youthful Arabella Higgins, taken twenty years ago, with the legend below slightly varied, "After Use of Professor Hardtop's Certain Cure for Corpulency." The face was the same in both cases, the figure, there was no denying it, had undergone decided alterations.

This gives an excellent explanation of many things that before seemed inexplicable. It is even better than that other explanation, furnished some time ago, by the publication of requests for testimonials in which it was stated that every one who sent a good testimonial for a certain medicine would receive a mantel clock, or any other prize that he might select from a list furnished by the proprietors. The premium habit has spread from the tea and coffee stores to the patent medicine establishments. It is an amusing study in psychology, however, to see whom the patent medicine managers select as the best people to secure testimonials from. Prominent clergymen, Senators, Representatives, judges and prominent actors, jostle one another on this stage, where the only thing needful is a good capacity for self-suggestion and autodelusion and a reasonable desire to annex a certain amount of the more or less easily earned money of the patent medicine man, in order to help him in still further securing the patronage that enables him to pay so well. A psychologist has recently written on the psychology of advertising. This field of the patent medicine man presents more opportunities for original research of the most interesting kind than any other that we know.

STELLWAG'S SYMPTOM ON THE STAGE.

For those who are interested in neurology, and especially external eye appearances in relation to certain nervous diseases, there were some very interesting observations to be made at the Vaudeville theater, where a French company was playing. Madame Wiehe, who took the principal characters, gave in a pantomime an imitation of a doll. For many minutes after being taken from the box in which the doll is supposed to have been shipped from France, even the most careful observation does not show any movement of the upper eyelids. It is usually said that there is an involuntary winking of the lids about every ten seconds. An initial symptom of Basedow's disease, first described by Stellwag, and often called Stellwag's symptom, though occasionally his name is associated, especially in countries other than Germany, with the so-called lagophthalmos, or hair eye, the inability of the patient to close the eyes completely, is the absence of winking over long

periods in the exophthalmic eyes. It is not in the most severe cases of exophthalmos that the winking is rarest, but there seems to be some interference with the nervous mechanism controlling the motions of the lids.

Usually it is considered impossible to control the movements of the lids, so as to prevent involuntary winking. The French actress seems, however, to have succeeded in training her lids so as to control their movements. At first the persistent stare of the eye is so marked that one is tempted to think that perhaps some preparation like collodion is applied to the upper eyelid, so as to help in preventing the involuntary nictitation. As, however, the man in the case is a Pygmalion, who succeeds in putting life into the doll, as the lovesick Greek sculptor did into his Galatea, there is some very lively winking of the eyes a little later, and yet, before the end of the piece, the doll, for purposes of her own, relapses into the first stage of more or less inanimate doll life and the winkless stare returns again.

The last of the short plays that ran at the Vaudeville, by the way, was by a Viennese physician, Dr. Arthur Schnitzler, whom many American medical students in Vienna have met during their residence in that lively city. The piece is distinctly French, and is sometimes said to out-Herod Herod in the matter of its Frenchiness. This is, perhaps, one of the reasons why it has been given the honor of adaptation into French and the introduction to a Parisian audience in this guise.

MEDICAL BIGOTRY.

It is the custom to think that bigotry belongs only to religious controversy and does not invade the field of scientific discussion. The *odium theologicum* is apt to be especially bitter, but it must not be forgotten that the *odium medicum* does not yield much to it in acerbity, and may do great harm. Some striking examples of it are furnished in the recent book on Hypnotism, its History, Practice and Theory, by Dr. J. Milne Bramwell, of Edinburgh, who is very well known as the author of a number of articles on the theory and practice of hypnotism. This book is published by the Lippincott Company, Philadelphia.

In English-speaking countries, at least during the first half of the nineteenth century, an interest in hypnotism on the part of a serious medical practitioner, and especially one whose talents and skill had procured for him a practice as a consultant, was almost sure to be followed by the loss of consultations. Three names particularly stand out in English medical history in this regard—they are Elliotson, Esdaile, who did his work in Calcutta, and Braid, who is very well known as the most authoritative early English writer on hypnotism.

"In 1831, Elliotson was appointed Professor of the Practice of Medicine at University College. His connection with that institution and the commencement of his mesmeric researches were described in the *Medical Times* by the writer already referred to, and I again quote the latter almost in his own words. Thus, he said, on the establishment of the University of London, or, as it is now called, University College, Elliotson moved there, as to a temple after his own heart, and devoted himself enthusiastically to its interests. He was all for the College, was its great impelling force, and worked for it with an alacrity and energy that explain much of its early progress. The hospital may be said to have been mainly his erection. Yet here, in the home of his labors, the scene of his triumphs, he received his greatest check. Dupotet's visit to this country attracted much attention to mesmerism, and led Elliotson to investigate the subject. His experiments were successful, and believing that he had found an opening into an unexplored science, he pursued them with zeal and daring enthusiasm. His reckless independence made him many enemies and official opposition to mesmerism led him to resign his hospital appointments. Notwithstanding this, Elliotson adhered to mesmerism and sacrificed to it friends, position and practice, but still looked forward to the hour when the profession would say of it, as of creosote, iodide of potash, prussic acid, auscultation, etc.: 'Useful novelties if properly employed.'" Elliotson was really, however, one of the most progressive medical men of his time.

"The *Lancet* pointed out that it was he who had shown how the heart sounds were influenced by posture, and had also drawn attention to many other hitherto unnoticed phenomena connected with auscultation. Elliotson, in fact, was the earliest to use the stethoscope in England and began to do so immediately after the publication of Laennec's work. At first he made his observations quietly in his hospital wards, but, as soon as he drew attention to them, he was ridiculed and abused. The stethoscope, as well as the facts of percussion and auscultation as described by Auenbrugger, were condemned as fallacies by the foremost teachers of medicine in London, while even at a much later date, they were treated at St. Thomas's with indignation or silent contempt. At the College of Physicians a senior fellow, in a Croonian Lecture, denounced the folly of carrying a piece of wood into a sickroom. Another condemned the stethoscope as worse than nonsense, and said: 'Oh, it's just the thing for Elliotson to rave about,' while a third, on seeing one on Elliotson's table, said: 'Ah! Do you use that hocus pocus?' On Elliotson replying that it was highly important, he added: 'You will learn nothing by it, and, if you do, you cannot treat disease the better.'

"In 1846 Elliotson's turn came to deliver the Harveian oration, but, as soon as it was known that he had accepted the office, he was attacked in the most savage manner, in order to prevent his appearing. For example, the *Lancet* called him a professional pariah; stated that his oration would strike a vital blow at legitimate medicine, and would be a black infamy degrading the arms of the College.

"Undeterred by this," continues Milne Bramwell, "Elliotson made mesmerism the subject of his address. Without referring to the attacks which had been made upon him he simply stated the result of his researches, and respectfully invited the College to examine alleged facts of overwhelming interest and importance. He exhorted his hearers to study mesmerism calmly and dispassionately, and reminded them with more truth than tact, that all the greatest discoveries in medical science, and the most important improvements in its practice, had been opposed by the profession in the most violent and unprincipled manner. As examples of scientific discoveries which had been received in this way, he cited those of the lacteal vessels, the thoracic duct, the sexual system of plants, the circulation of the blood, the sounds of the chest and their relation to the diseases of the heart and lungs and their coverings, etc. As instances of improvement in practice which had been treated in like manner, he referred to the employment of Peruvian bark, inoculation and vaccination for smallpox, the use of mild dressings, instead of boiling oil, in gunshot wounds, the ligature of the bleeding vessels after operation, instead of the application of burning pitch or red-hot irons, etc. We should, Elliotson said, never forget these things, nor allow authority, conceit, habit or fear of ridicule to make us hostile to truth. We should always have before our eyes that memorable passage in Harvey's works: 'True philosophers, compelled by the love of truth and

wisdom, never fancy themselves so wise or full of sense as not to yield to truth from any source and at all times; nor are they so narrow-minded as to believe any art or science has been handed down in such a state of perfection to us by our predecessors that nothing remains for future industry.' All this, Elliotson said, should be borne in mind when considering the alleged facts of mesmerism. In his opinion many of these were indisputable; for ten years he had shown how mesmerism could prevent pain during surgical operation, produce sleep and ease in sickness, and even cure many diseases which had been unrelieved by ordinary methods. It was the imperative and solemn duty of the profession carefully and dispassionately to examine the subject. He, therefore, earnestly implored them to do so, if they cared for truth, their own dignity and the good of mankind."

Dr. Bramwell shows how the great Braid shared the obloquy of those interested in hypnotism. Braid frequently referred to the almost incredible opposition he had to combat, both at the hands of the orthodox medical practitioner, and of the mesmerists. His explanation of this is given in his own words:

"'Throughout the whole of my inquiries my chief desire has been to arrive at what could be rendered most practically useful for the relief and cure of disease; and I hesitate not to say that, in the hands of a skilful medical man, who thoroughly understands the peculiar modes which I have devised for varying the effects in a manner applicable to different cases, hypnotism, besides being the speediest method for inducing the condition, is, moreover, capable of achieving *all* the *good* to be attained by the *ordinary mesmerising processes,* and *much more.* . . . Like the originators of all new views, however, hypnotism has subjected me to much contention; for the skeptics, from not perceiving the difference between my method and that of the mesmerists, and the limited extent of my own pretensions, were equally hostile to hypnotism, as they had been to mesmerism; and the mesmerists, thinking their craft was in danger—that their mystical idol was threatened to be shorn of some of its glory by the advent of a new rival—buckled on their armor, and soon proved that the *odium mesmericum* was as inveterate as the *odium theologicum.*'"

The third of the group of English medical observers to suffer from interest in hypnotism was Esdaile. In March, 1852, Esdaile published a pamphlet on The Introduction of Mesmerism as an Anesthetic and Curative Agent into the Hospitals of India, which he dedicated to the members of the medical profession. In this he complained bitterly of his treatment by the editors of different medical journals and of their determined attempt to suppress all evidence in favor of mesmerism. Professor J. Y. Simpson, of Edinburgh, had written to Esdaile to the effect that he owed it to himself and to his profession to let his proceedings be known in England. In response to this Esdaile sent an account to an English medical journal of 161 scrotal tumors removed during mesmeric trance. The history of what followed, and Esdaile's opinion of the treatment he received, shall be given in his own words:

"'My article was not published, and I then sent a more general paper containing a résumé of my surgical work. This was rejected for its *unpractical character!* I have heard that it is given as a reason for not printing my paper that, though no one now denies my facts, these apply to the natives of India only. But, as far as I know, no medical journal has admitted the reality of *painless mesmeric operations,* even for India, or inserted one of the numerous European cases reported from London, Paris, Cherbourg, etc. They will not admit, or permit you even to hear of, such indisputable facts, through fear of the consequences.'"

OPTIMISM.

Physicians who find patients discouraged under the weight, only too often, of imaginary woes, and who wish to arouse them to some sense of how good the world may seem even under the most trying circumstances to a really grave spirit, should prescribe the reading of Miss Helen Keller's little book on Optimism, which has recently been published by C. P. Crowell & Co., in New York. Most physicians know the story of Helen Keller very well. As the result of one of the infectious fevers in childhood she became blind, deaf and dumb. Notwithstanding this she was graduated with honors from college and university, and has written an autobiography that is one of the most interesting of human documents. The present volume is an essay in which she shows how many are the bright things in life for her, notwithstanding her apparently insurmountable infirmities. A good example of how she is able to bring darkness out of light is contained in the following sentences:

"When I learned from Berkeley that your eyes receive an inverted image of things which your brain unconsciously corrects, I began to suspect that the eye is not a very reliable instrument after all, and I felt as one who had been restored to equality with others, glad, not because the senses avail them so little, but because in God's eternal world, mind and spirit avail so much."

As a reviewer in the New York *Independent* said: "Nothing can be finer under the circumstances than this assertion, made so simply, and with such an air of personal conviction. In fact, one of the remarkable features of this essay is the experimental note in it, as if the writer had tested intimately every high doctrine she holds. Her philosophy is not the expression by rote of a person who has been well taught, but it is wisdom she has learned of her own volition and fitted to the bright heart of her darkness, a sort of psychic illuminating of her own mind. And in her vision of things there is no evidence of prejudiced deafness, and in the eloquence of her optimism no hint of dumbness."

AUTOMATIC DRAWING.

The peculiar things that may happen under pathological conditions of mentality have evidently not all been exhausted. A few years ago a young girl at the Salpetriere wrote some very curious, but absolutely unintelligible messages. Notwithstanding the failure to understand them she continued to write, and as this was the only means of expression she had in her deeply hysterical condition every effort was made to solve the riddle of the writing. Finally it was found that it was really mirror writing—that is, ordinary letters written in back hand and from right to left, such as Leonardo da Vinci, for some curious but unknown reason, employed in certain of his scientific manuscripts, wishing perhaps to conceal his original discoveries from those of his generation who might care to employ them for their own advantage or develop them for industrial applications, without giving their inventor due credit. Since the case of the Salpetriere girl a number of other cases have been recorded in which mirror writing was one of the symptoms. Just what curious functional disturbance of the cerebrum and the connecting neurons brings it about is indeed hard to understand.

In the January number of the *Popular Science Monthly,* Professor William James, Professor of Psychology and Philosophy at Harvard University, gives some details of a case of automatic drawing. The subject in this curious experience made peculiar draw-

ings of whose outline he was almost unconscious himself, apparently as the result of the guiding power of a secondary personality. These drawings, which are mainly quaint portraits of human beings, all have a certain similarity of type and this type is utterly unfamiliar in any other connection to the person whose hand is used in making them. The subject says: "My hand executed these without volition or direction from my natural self. My mind directed neither the design nor the execution. A new power usurped for the time being the functions of my natural or every-day mind. Many times I tried to produce pictures of familiar faces, or scenes familiar to me by long association. I could produce nothing in this direction, but confusion was the result of the attempt. My hand continued to be guided by the unknown power. Weird, fantastic pictures were produced in abundance, many of them artistic in execution, but mostly of ancient type.

"Sometimes the face would be so covered with strange devices as scarcely to be recognized as being intended for a face. Frequently a rock would be drawn with faces hewn in it. While drawing these pictures I became drowsy, so much so that after finishing an artistic one, I would sometimes go into an hypnotic sleep, and always would, after a long sitting, if I did not combat the influence. My pencil sometimes moved so rapidly as to make it difficult to follow it with my eye, at other times it moved slowly. Some of the best effects were produced by rapid movements. I never knew what my pencil would make when it commenced, and often did not know until finished. Sometimes a design would be entirely changed.

"Small pictures were frequently produced by a few rapid movements of the pencil from side to side, the pencil apparently not being lifted, yet the features of the face and general contour of the subject in hand would appear plainly. Voluntary suggestion has little effect on the drawings. After repeated suggestions, I have sometimes been able to obtain an allegorical picture, as for instance, when I asked for a message from my son, who resided at a distance, a carrier pigeon, having a ribbon around its neck with a letter attached, was produced.

"I have tried hard to account for the power or directing mind that produces these pictures, but so far with no satisfactory result. I must say, however, that evidence to me is strong that, in order that the unknown power should have sway, the natural or earthly mind must be for the time being set aside, either entirely, or (what seems to me more reasonable), the unknown power is the dominant one, but acts in conjunction with the earthly mind. Although while drawing, I feel more or less drowsy, my senses seem in some respects to be very keen. To my eyes the pictures usually appear highly exaggerated in beauty as well as distinctness."

New Method of Identifying Human Blood.—A valuable observation, made by H. MARX and E. EHRENROTH (Münch. med. Woch., Feb. 16, 1904), may be destined to replace the more complicated serodiagnosis in identifying human blood. The two authors discovered that if foreign serum is added to human blood, a rapid and complete agglutination of the erythrocytes occurs, while with homologous serum they are hardly influenced. The serum of monkeys behaves like homologous serum, except that the cells shrink and become polygonal instead of crenated. The technic is extremely simple: the suspicious blood is dissolved with a very small quantity of normal salt solution, mixed with a loopful of blood taken from the finger-tip and examined with the low power for the next fifteen minutes. Numerous tests gave as accurate results as serodiagnosis.

SOCIETY PROCEEDINGS.

THE SOCIETY OF THE ALUMNI OF CITY HOSPITAL.

One Hundred and Twelfth Stated Meeting, held February 10, 1904.

Hemorrhagic Diseases in Children.—This paper was presented by Dr. William L. Stowell. He stated that purpura is not a disease in itself, but the outward manifestation of a group of conditions not yet well understood. It signifies purple spots of hemorrhagic origin which occur in the skin upon mucous membranes and indeed upon all parts and organs of the body. It may seem to be due to one of the following: (1) Vasoneurosis, as in locomotor ataxia; (2) a drug, as iodide of potash; (3) an infectious disease, as diphtheria or smallpox; (4) a diathesis, as in rheumatism; (5) a special germ; and, lastly (6) a toxin, as in enteritis, following the ingestion of tainted food. The author cited a series of cases from which he deduced the following conclusions as to the indications for treatment. Of maximum importance, probably, is the proper management of the feeding of these patients, orange or lemon juice being frequently called for. Calcium chloride increases the coagulability of the blood and tends to check the hemorrhages. Vegetable acids and arsenic are useful. Among the newer drugs stypticin and suprarenal gland stand first; a number of cures of intractable cases having been reported through the use of these drugs. Adrenalin probably is our best drug. In conclusion, he stated that a specific germ is not yet demonstrated for all cases.

Dr. R. C. Newton said that young children possess very low resisting powers to bacteriological toxins. He asked the essayist whether he had not found it frequent for fatal cases to have persistent vomiting. Dr. Stowell replied that they invariably did vomit, if the infection was located in the gastro intestinal tract. Smith has reported 49 such cases. Dr. Newton believed that the persistent vomiting was probably an effort on the part of nature to get rid of the toxins.

Dr. Gessner Harrison reported a case in which the trouble had started from a scratch under the tongue. Infection was followed by a purpuric eruption. The patient recovered.

Case of Purpura due to Gastro-intestinal Disturbance with Final Recovery of the Child.—Dr. A. A. Moore reported this case. Another case had come under his care which had been mistaken for cerebrospinal meningitis. There were purpuric spots on the chest and abdomen, besides hemorrhages into the mucous membranes of the mouth. On autopsy, hemorrhages were found in the gastric mucous membrane and at the base of the brain.

Dr. A. Rupp cited a report whose author had investigated a number of these cases occurring in Italy. According to this author purpura was followed by icterus simulating yellow fever. Some cases show a waxy degeneration of the intima of the arteries.

Dr. R. Waldo had seen a number of cases in which the family history of the patient was decidedly tainted with tuberculosis and cerebral hemorrhage. In some people the onset of purpura may be extremely sudden. It is quite possible for such cases to be the victims of cerebral hemorrhage.

Dr. Oppenheimer cited a case of purpura which had followed a diphtheritic throat. Later the right eye grew black and in time sloughed out. The same condition developed later in the left eye, and was treated by incision. Sight was not preserved but light perception remained.

Dr. Terriberry had seen one case in which the pur-

pura had followed syphilis and had disappeared under anti-syphilitic treatment.

Dr. Stowell, in closing, said that the unusual fetor of the stools was due to hemorrhage from the mucous membrane of the gut. Authorities were much confused as to the etiology of hemorrhagic diseases in childhood, no definite knowledge being at hand up to date. One or two writers had believed that there were definite changes in the intima of the arteries and that the blood broke through the arterial wall directly into the tissues. He agreed with Dr. A. Jacobi that the three diseases, scurvy, purpura and hemophilia were manifestations of the same condition.

Abuse of the Uterine Curette.—Dr. Ralph Waldo said that he did not wish to criticize the legitimate use of this valuable instrument, but he felt it wise to direct the attention of the Society to the fact that it is used too freely and in an improper manner. This he ascribes to the fact, first, that the indications for its use are not properly understood, and second, that a positive diagnosis is not made before operation is undertaken. He confined his attention solely to those cases in which pregnancy had recently existed and in which the uterus had been partially or completely emptied. He said that there were but two legitimate uses for the curette under these conditions; one is to utilize the instrument as a sound for exploration, the other to employ it for the removal of foreign material. A sharp instrument should never be used for these conditions. If the body of the uterus is found to be abnormally large, it can usually be thoroughly emptied without the use of an anesthetic. The author emphasized the necessity of thoroughly and completely emptying the uterus at one sitting, repeated employment of the curette being strongly contraindicated. He believed that it is better to do nothing at all than to use a sharp curette and to partially remove the offending material, because this simply opens a way for the entrance for septic material.

Dr. W. Ridgely Stone said that it appeared that Dr. Waldo had unintentionally omitted to mention that the chief reason for the uselessness of the curette in cases of streptococcic infection was that the streptococci did not lie upon the surface of the infected mucosa, but were deep down in the lymphatics, far beyond the reach of the instrument.

Dr. A. A. Moore said that in examining 1,200 histories of cases of this character, he had found no mortality, whenever no instrument whatsoever had been used. From this he had concluded that no instrument, not even a dull curette, should be employed. He advised the use of saline irrigations and rectal enemata in the treatment of these cases.

Dr. C. G. Child preferred to use his finger to establish the diagnosis of the presence of retained secundines. Most infections he believed to be due to dirty instruments, clean instruments never being harmful when introduced into the uterine cavity. Sharp curettes, he declared, had never done harm in his hands, nor would they in the hands of others, if properly used. The patency of the cervical canal could not be considered a reliable sign of retained membranes, as this was most frequently caused by laceration of the internal os. A large number of the cases of profound sepsis were, in his opinion, due to the puncture of the uterus by a dirty curette, this lesion being usually brought about by a faulty technic.

Dr. R. C. Newton said that for years he had been in the habit of using the sharp curette in cases similar to those under discussion and had invariably met with admirable success.

Dr. Waldo, in closing, said that if the lochia were offensive, and whenever there was reason to suspect that some portion of the membranes were retained, the curette was indicated. His opinion as to the danger of the sharp instrument was unaltered. He declared that if the curette had never been invented, there would have been fewer deaths, most cases of sapremia recovering without operative intervention.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON GENITO-URINARY DISEASES.

Stated Meeting, held February 17, 1904.

The President, James Pedersen, M.D., in the Chair.

Presentation of Pus-kidney and Ureter.—Dr. J. B. Bissell presented this specimen which was removed from a man, forty-four years of age, at St. Vincent's Hospital last December. The following history was given. He was a man of very intemperate habits and had been in the hospital two or three months previous for treatment of alcoholism. He had had repeated attacks of urethritis and, two years ago, was operated upon in Chicago for a very tight stricture of the deep urethra, perineal section and drainage being followed by a good result, but this was neglected, no sounds being passed or any after-treatment being followed. In the hospital he was turned over to the surgical side from the medical because of an attack of cystitis. Before coming in very small instruments could be passed. Under gas anesthesia a filiform went through and the urethra was dilated a slight amount. It bled a good deal and was hard to dilate. Temperature and pain suddenly developed and he was unable to sleep. The urine being filled with pus perineal section was performed and it was with difficulty that he was able to cut through the perineal floor because of the dense cicatricial tissue. At the end of two or three days after the operation the temperature rose to 103° F. and stayed there; there was severe pain over the abdomen, more especially about the umbilicus and in the region of the bladder. The high temperature and bad pulse continued. The urine contained albumin and all sorts of casts. There was no pain in the left kidney. The patient died and, as no autopsy was allowed, the specimen was obtained surreptitiously. The kidney was shown to be filled with pus, without any kidney tissue left except the capsule and some fibrous tissue dividing in a general way the pyramids. A large tumor was found between the bladder and rectum which ruptured under examination and from which came a great deal of pus. It was an abscess. Cutting off the ureter from the kidney two fingers could be introduced into the cavity of the ureter, which was about one inch in caliber; the tube ran down through the abscess cavity and then into the bladder and its potency had been occluded at its junction with the bladder by the pressure of this abscess.

Dr. George E. Brewer said he was reminded of a couple of similar cases seen last summer within one week of each other. One case had been treated for many months for malaria, the diagnosis being made because of a supposed enlarged spleen, chills every day, with temperature ranging from 100° to 105° F. and followed by sweating. The oval renal tumor on the left side was taken for an enlarged spleen. The blood count gave 30,000 leucocytes. A primary nephrectomy was performed. The kidney contained over 1½ pints of pus. Within one week of this he saw another case, one of puerperal infection. The trouble in the kidney was for a time overlooked. There was an acute sepsis, the symptoms somewhat resembling those of malaria. The renal tumor was about the size of an infant's head, was movable and very tender to pressure. The operation was a difficult one on account of the size of the

kidney and adhesions. It was incised and drained before it could be delivered. Both cases made satisfactory recoveries.

Dr. Edward L. Keyes, Jr., was reminded of a case quite the opposite from that referred to by Dr. Brewer. This patient had a very large kidney, which was not palpable, although it discharged a pint or more of thick pus in twenty-four hours. The patient was very stout, and this perhaps accounted for the fact that, although the loin was tender, no tumor could be felt. It is astonishing how large a tumor may exist in the loin and yet be impalpable.

Foreign Bodies in Perineum.—Dr. John F. Erdmann presented parts of two needles which he had removed from the perineum of a male about two weeks ago. The patient was thirty-two years of age and contracted gonorrhea from his wife. Three years ago he was operated upon for a deep stricture, the perineal operation being done. At that time he was told that a needle had been left in the wound. A year or so afterward, having an irritation in the urethra, he was cystoscoped and a large tumor of the bladder diagnosticated. A suprapubic operation was performed for purposes of exploration and nothing found. The wound was allowed to close. He was then treated for a profuse suppuration, pus passing by way of the meatus, and a fistula occurred in the center of the perineum. The pus was charged with gonococci and the fistula in the right buttock communicated with the urethral canal. The needle was supposed to have been left in the perineum. In passing a sound Dr. Erdmann felt it slip as if over the triangular ligament. Later he got a metallic grate and therefore did a perineal section. In trying to cut through the knife suddenly stopped, evidently having struck the needle. The parts were stretched and three small portions of the needle, broken during the attempt, were removed. While retracting the wound he found a large arc of steel minus the eye. Patient was doing well and was without further symptoms. Dr. Erdmann said it was strange to find parts of two needles which had been left in the wound at one operation.

Dr. Eugene Fuller said there had been a man in the City Hospital who had been operated upon four or five times in the attempt to close a spacious perineal fistula. He did a very extensive plastic operation and felt very proud because he closed the fistula. The man was quite comfortable for some time after, when frequency of urination developed. On making an examination a short time ago, he struck a large Hagedorn needle in the deep part of the urethra. It had evidently been broken off at some early operation. He tried to remove it through the urethra but could not and felt justified in temporarily leaving it, hoping it would work to the surface. He was averse to cut through the perineum, unless positively necessary, because the tissues were so badly nourished that he feared non-union of a fresh incision might result in the production of a fistulous tract.

Dr. Beck referred to Hyrte's book on comparative anatomy, in which were shown foreign bodies, especially needles, in the perineum and bladder. He emphasized the importance of taking X-ray pictures in obscure cases; by so doing it was wonderful how often some unexpected information could be had by a study of the skiagraph. He could report many cases of this kind. In cases of calculi in the bladder, although the sound would reveal more than the X-ray in one way, still the latter gave excellent additional information regarding the size and number of stones in the bladder. He thought it would always pay the specialist to take skiagraphs.

Dermoid Cyst and Vesical Calculus.—Dr. Edward L. Keyes, Jr., presented these specimens. The patient was twenty-four years old and had suffered from various troubles for four years. Before this time she had some dysmenorrhea. The sickness began with an abscess said to be in the left ovary. Operation was suggested and refused, and the abscess burst into the intestine. She then suffered from alleged colitis and had many febrile attacks, sometimes called malaria and once attributed to typhoid. The malarial attacks lasted unduly long, while the typhoid was remarkably short. She then developed cystitis and, about a year ago, began to pass small stones from the bladder. These were said to come from the kidney; and when she exhibited two larger ones formed upon hairs, she was told that she had swallowed the hairs. This, in spite of the fact that examination revealed that every one of the many stones she had passed had a hair for nucleus. Last April litholapaxy was performed and the urethra stretched for digital examination. After the operation she was told that her stones were all gone, and when, ten days later, they again reappeared, she was informed that the urethra had been dilated in order to permit these stones to pass readily. She came into Dr. Keyes' hands last fall; and cystoscopy revealed two stones attached to the bladder above the right ureteral orifice. Laparotomy revealed a dermoid cyst absolutely incorporated in the pelvic wall by dense adhesions—the result of previous inflammation. The cyst could not be enucleated and so was opened. He shelled out the growth which presented. No attempt was made to close the openings into the bladder and the bowel. Drainage by a tube above and a permanent catheter below. Recovery was uneventful, except for a scare caused by the passage of three small stones three weeks after the operation. These had undoubtedly been overlooked at the time. She has passed no other stones in the twelve weeks since operation. Although she had passed gas from the bladder from time to time during the past year, the vesico-intestinal fistula closed at the end of three weeks; reopened for a week in January and has been closed ever since. She is now entirely well, except for the incontinence of urine which returned two weeks ago after a severe fall. This incontinence is apparently neurotic. Specimens of the cyst and of calculi dependent from hairs were shown.

Case of Hematuria.—Dr. Alfred T. Osgood reported this case for Dr. F. Tilden Brown, who was unable to be present. The patient was a man, seventy years old, whose father died of cancer of the tongue and his brother of pulmonary tuberculosis. There was no history of nephritis or of hemophilia in the family. The patient had not used alcohol for twenty years and had never had any venereal disease. Previous history was good. In 1898, for seven or eight months, he had attack of colicky pains localized in the bladder region, which was thought to be intestinal. No blood was noticed during this time in the urine. Never had pain referable to either loin, testis or thigh; no chills or fever. The following eight weeks he was without pain. Then, at urination, the stream suddenly stopped with a sharp cutting sensation in the urethra and a rough oval stone, the size of a lemon seed, was removed from the fossa navicularis. This occurred in 1899, and he was perfectly well until November, 1903, when he noticed blood in his urine which continued to be present for a week. Some of the time clots in the bladder made urination difficult. One week later, after heavy lifting, the hematuria recurred and with it some pain in the bladder region and the passage of clotted blood. After resting a week the bleeding ceased but recurred on further exertion. Since Christmas the hematuria

had been constant but the patient no longer had the pain behind the symphysis and had passed no clots. No signs or symptoms were present beyond the passing of bloody urine. Various diagnoses had been made by different doctors. He was first seen by Dr. Brown January 5, 1904. The urine was passed voluntarily and had the appearance of blood; on allowing it to settle it was found to contain one-tenth to one-fifteenth of red sediment made up only of blood cells, the leucocytes being in the proportion of normal blood. On January 16 cystoscopic examination showed a practically normal bladder and ureteral mouths. Blood issued from the right ureter. On January 22 both ureters were catheterized and the urines obtained were presented to the Section. The urine from the left ureter was normal except for a faint trace of albumin. That from the right ureter showed blood. The catheter was passed to the pelvis showing that the blood originated there. Forty to fifty ounces of urine were passed each day. Two or three radiographs revealed nothing. The case was presented really as one for diagnosis.

Dr. Carl Beck said that if the skiagraphic picture was good enough to show the spinal column, the twelfth rib and the psoas muscle, one might be able to exclude nephrolithiasis; but if it did not show these structures distinctly the skiagraph could not be relied upon for this purpose. The clinical history of cases had shown that many shadows had been misinterpreted; a negative skiagraph had been proven to be at fault and a positive shadow made later by other operators; therefore, the skiagraph could be relied upon only if it was perfect.

Dr. Eugene Fuller referred to a case where the diagnosis made from the clinical symptoms was probably stone in the kidney. A skiagraph was taken and showed nothing at all. The patient went to another city, another skiagraph was taken and stone was beautifully shown as being in the pelvis of the kidney; the stone was the size of a small marble and well defined. He believed that to get good result a number of pictures must be taken and in different places. In many cases of hematuria one may expose the kidney and even then be at a loss to account for the bleeding. Oftentimes in doing this and tearing the capsule somewhat the bleeding will afterward cease.

Dr. Charles H. Chetwood reported a similar case before the Section about a year ago. The history of hematuria was given without symptoms of nephralgia or colic. The cystoscope revealed that the blood came from one ureter, the jet from the opposite side being perfectly clear. No attempt was made to do a double ureteral catheterization on account of the clearness of the cystoscopic demonstration. The flank was opened and the kidney exposed. A search was made for stone, but none found. The capsule was then split and the pelvis of the kidney was then opened, and still there was nothing abnormal seen in the gross appearance. A catheter was passed down the ureter, but no occlusion detected. In one portion of the kidney there was a small area a little more dense than the surrounding structure, and a piece of this was removed for pathological examination. Previous to operation the urine had been examined, but absolutely nothing abnormal found, otherwise than the presence of blood. The piece of tissue removed, upon examination, showed evidences of parenchymatous nephritis. This case demonstrated the fact that one may meet a case of profuse hematuria referable to the kidney without there being any lesion demonstrable upon gross examination of the kidney or by laboratory analysis of the urine. One of the most important features of this case was that, after decapsulation of the kidney, the hemorrhage absolutely ceased and was seen for months afterward without showing any return of the blood in the urine.

Dr. J. B. Bissell believed that the diagnosis should be held in abeyance until incision was made into the kidney. Until that had been done we could only speculate regarding the cause of the hematuria.

Dr. James Pedersen said that he remembered hearing Dr. W. T. Bull remark that a papillomatous condition of the pelvis of the kidney could exist and give rise to hematuria without any other symptom.

Dr. Carl Beck said that the skiagraph was absolutely unreliable and would not show whether a stone was present or not. He could appreciate the difficulties in taking such skiagraphs. The chances of getting better skiagraphs were increased by compressing the abdomen and pushing in the tissues as much as possible by a diaphragm and taking two or more pictures.

Operative Surgery Applied to the Seminal Vesicles: A Demonstration of Some New Principles.—Dr. Eugene Fuller read this paper. He said the inaccessibility of the seminal vesicles was such as to prevent pathological conditions there from being recognized except by those who paid especial attention to this field. In his experimental work his aim had been to discover, first, the best operative method to expose the seminal vesicles and, second, the appropriate surgical treatment for the different types of disease. The chief features of the operative technic (read in Feb., 1901, and published in May, 1901) were the knee-chest position and the extent of the lateral incision which allowed a free dislocation upward of the rectum. Seminal vesiclotomy was the term applied to the new surgical procedure. He had 21 cases which were subdivided into five groups. Group 1 consisted of extremely chronic cases of seminal vesiculitis in which the lesions consisted chiefly of sclerosed tissue, not only the walls of the seminal vesicles but the surrounding fibrous tissues with the result that the cavities of the seminal vesicles were contracted and the sacs bound down by adhesions. Six of his cases were of this group, and in four his results were good, in two negative, as far as the removal of clinical symptoms were concerned. Group 2 consisted of cases of seminal vesiculitis less chronic than those of Group 1. The intravesical catarrh was still a prominent feature and there was no contraction of the sac cavities; in fact, in some there was an atonic distention of the sac cavities. Eight of his cases were of this group and three had been discharged in satisfactory condition and he expected they were cured by the operation. Of the remaining five good results positively followed in three; two cases were lost sight of. Group 3 consisted of cases of acute diffuse periseminal vesicle abscess with gonorrhea as the infective agent. All results were good in this class. In Group 4 the lesion was an adenoma which involved the wall of the seminal vesicle causing an obliteration of the sac cavity to a large degree. The result after removal was good. Group 5, the lesion was tuberculous involvement of the seminal vesicles and removal of the sac caused only temporary relief. A sinus persisted and the patient died through extension of the tuberculous process. Then followed a detailed recital of the cases. His results were such as to warrant him in advocating this treatment in many cases of Group 1, some in Group 2, and in all cases of Groups 3 and 4. In Group 5 nothing was gained by operation. For the liberation of pus in this region the operation under consideration he believed to be better than those in vogue, *i.e.*, perineal section, with a median incision through the trigonum; incision through the rectal wall; perineal incision through the prostate.

Dr. Chetwood has had no personal experience in

operating upon the seminal vesicles, and his knowledge of the subject was obtained largely from its literature. As a result of such reading, it seemed to him that one of the principal questions at issue was the route and technic to be selected, of which there were various modifications and, like operations upon the prostate, some adopted a supra and others an infra means of approach. The method of Drs. Duval and Daudet approached the seminal vesicle through the inguinal region and claimed to obtain by this technic a satisfactory view. With the purpose of enlarging the field in reaching the vesicles and adjacent organs, this operation was modified by Young, of Baltimore, who advises suprapubic cystotomy with a large incision augmented by a lateral one. The perineal operation, on the other hand, has been modified by the addition of a supplementary sacral flap, after Kraske and Schlange, as favored by Koenig and others. A casual observer would be inclined to believe that the perineal incision for approaching the vesicles is the one of choice for drainage purposes. In case, however, of extensive lesions, tuberculous or otherwise, it seemed as though it were necessary to perform one of the operations which enlarged the field of vision; such as that of Young by the suprapubic route, or the perineal operation supplemented by the sacral flap. Dr. Chetwood had experimented upon post-mortem subjects, and had found that Young's method gave an ample view of the parts. However, after hearing Dr. Fuller's array of successful cases, his method must be accepted as being satisfactory for a large proportion of cases; even though there was extensive involvement of the parts and a very radical operation was undertaken.

Dr. J. B. Bissell said that none of those present probably had had an opportunity to operate upon such cases and watch the results as Dr. Fuller had. He agreed entirely with what had been said regarding the non-operative interference with tuberculous disease of the genito-urinary organs, and particularly of the seminal vesicles. Such interference usually made the condition worse. He thought the method described in the paper to be a very satisfactory one but, like Dr. Chetwood, he had never performed that special operation. But, in order to reach the seminal vesicles satisfactorily he thought that of Zuckerkandl's incision and next that of Dr. Fuller's to be probably the most available. He said he was puzzled regarding the question of diagnosis and also the prognosis of disease of the seminal vesicles.

Dr. James Pedersen said he had had the opportunity of seeing Dr. Fuller operate on one or two of his cases and he could say that his method for reaching the seminal vesicles was a very good one, especially in Dr. Fuller's hands.

Dr. Eugene Fuller said that he hoped others would try to do work in this direction because there were many cases in need of relief to make them able-bodied floating around from one hospital to another, all of whom were ready and glad to be operated upon to get relief. He said he had been satisfied with the results he had obtained and felt that he had accomplished a great deal for this class of sufferers. His first five cases he had watched for over a year and then he made his preliminary report announcing the results. After getting evidences on the findings of these first five cases and finding them quite satisfactory he then started in to do more operative work of this nature. So far as the routes were concerned, most of them were too serious operatively to be thought of, the one through the bladder was not practical, as the seminal vesicles cannot be reached readily in that way. The operation of going through the abdomen and depressing the bladder was an awful operation, especially when done upon a tuberculous patient. The operation he advocated took less than fifteen minutes and none of his cases, now numbering 21, gave dangerous symptoms. The Kraske and Rydygier operations, cutting across the sacrum, were all capital operations and left the patients, as a rule, for a long time in a serious condition. It was usually six months or more before these patients were well. The incision he made was a freer one and he dislocated the rectum upward and out of the way. The diagnosis of these cases he said was usually made by rectal feel and required a well-trained sense of touch. With an educated finger one could readily map affairs out well, but it required practice. This tactile sense should be practised upon both normal as well as diseased conditions. Most people confounded prostatitis and seminal vesiculitis—two entirely separate affections. There was no surgical reason why patients should not get well after his operation of seminal vesicotomy any more than after cystotomy in certain cases of cystitis. The surgical principles which he had applied to the seminal vesicles were new only in so far as the seminal vesicles were concerned. In connection with the urinary bladder, the renal pelvis and the gall-bladder they had been long applied.

Dr. Carl Beck said that in the October meeting of this Section a case had been reported by Dr. Lilienthal with the title "Deformity of Penis Resulting from Operations for Relief of Hypospadias." According to this report it was said that "the first operation performed upon him was a Beck, and it appeared as if, when the urethra had been drawn through the anterior part of the glans and stitched there, it had sloughed, and as it descended it had seemed to have drawn with it a portion of the glans, etc." Dr. Beck had written Dr. Lilienthal before the last meeting and asked for a correction of this statement. In the article it was also written, "a deformity which had followed ten previous operations for the relief of hypospadias." "When first seen by Dr. Lilienthal the deformity was such that it was difficult to recognize the organ as a penis." Dr. Beck said he had not operated upon him ten times, but only four, and that the first operation was for a penile hypospadias of moderate degree. It is only in such cases that he advises his method of anterior dislocation, originally advised for the balanic type only. He does not advise it in the severe penile type, because the distensibility of the penis has its limits. He was afraid the usefulness of the operation had been much impaired through this report in the MEDICAL NEWS (December 5, 1903). The truth of the matter was that after having operated upon this patient at St. Mark's Hospital the patient the next morning took a pocket knife and cut off the catheter in the urethra and therefore caused a failure. Another plan of operation was now considered. Although the patient was circumcised and had only a small portion of a prepuce left, Dr. Beck dissected through, turned it back and implanted it in such a way that it could be used later for the formation of a new urethra. After the bridge was dissected and a flap from the scrotum formed, in order to cover the new urethral canal, the patient insisted upon leaving the hospital. The patient signed a paper stating that he knew that he would injure himself by getting up and left the institution against the doctor's advice. In the article mentioned it was stated that "When Dr. Lilienthal first saw him, a portion of the glans appeared as an isolated fragment, entirely separated from the glans penis." Dr. Beck said this fragment was the carefully transplanted remnant of the prepuce. While Dr. Beck fully realized that failures are possible in the hands of even the best experts, in this patient the fault was not the method but the extreme nervous condition of the patient.

BOOK REVIEWS.

BIOGRAPHIC CLINICS. Vol. II. By GEORGE M. GOULD, M.D. P. Blakiston's Son & Co., Philadelphia.

THERE are few literary diversions more interesting and innocent than trailing an idea through one's favorite authors with a pencil. One can underline all passages bearing on one's subject, ignoring those that upset one's theories, jot the page number of the selections on a blank page, and transfer them at leisure to a large notebook. After several years of this pleasurable pastime one will have material enough to make an original book of one's own, which, if one should be fortunate enough to excite the animosity of critics, one might sell with some profit, and much éclat.

We have ourselves read somewhat with the idea of collecting material to show that heroines with red hair are possessed of indomitable wills and great energy of character inherited from a remote but famous ancestor; but we doubt whether we could bring out anything so convincing as the "Strange Mystery of the Disease of Fourteen," which Dr. George M. Gould has evolved from his extensive biographical reading. In his second volume of Biographic Clinics, the Fourteen are sons and daughters of genius, that lived in the last century, and have illumed literature, but who, it seems, all unknowingly lived martyr's lives due to eye strain. The continued excerpts from George Eliot's familiar letters, "very irritated to-day," "terrible headache," are repeated in the quotations of the letters of Carlyle and his wife, Darwin, Nietzsche, Wagner, Spencer and the rest, all of whom foolishly attributed their suffering to tire of city life, care, work, indigestion, and who took the advice of the very famous, but misinformed physicians who attended them, to go to Italy, or the country, or the Highlands.

We remember, from the casual reading of our own unnoted copies of their biographies, that this change frequently benefited them, that De Quincey and Browning were in good form when they walked and walked; but we see now that it was a "pitiful waste of time" for, as Dr. Gould points out, "fully three-fourths of Carlyle's working time and ability were spent in horse-back riding, walking, and in recovering from the exhaustion of writing," while "much of Mrs. Carlyle's life was spent in thirty to sixty hour continuous vomiting," although another excerpt says that for ten years she walked six to ten miles a day, and Darwin spent hours "walking like a dumb animal about his sand-walk, or more foolishly enduring the brutal water-cure." What would not their literary output have been had their physician fitted them with spectacles, so that they could have done a full day's work.

But Dr. Gould calls our attention to the fact that most of the fourteen affected to scorn spectacles, and had they been willing to wear them they could not have obtained scientifically correct ones. And this is the strong point. The neurologists and ophthalmologists do not know their business. They will persist in attributing to hereditary, and brain work, and lack of fresh air, millions of cases of migraine and neurasthenia that ought to be called "eye strain," and when they do suggest spectacles they only aggravate the trouble by prescribing wrong ones.

Dr. Gould expected that when he pointed out in his first volume the enormity of the mistake of the medical profession in ignoring this truth, that the ophthalmologists, at least would be grateful to him; but the levity of some and the bitterness of others has naturally hurt his feelings, although he takes pains to state that he is "neither discouraged nor scornful."

Even when a "great and famous ophthalmic surgeon," to quote his own words, "told him that he had examined large numbers of patients who complained of the same troubles as Darwin, Wagner, Parkman and the rest, and found that they had no optical defects whatever," yet Dr. Gould was patient with him, and only told him, to quote again, "that all history is full of instances of the failure of the official leaders or representatives of religious art and science to recognize the new truth which finally supplanted the pitiable truth they stood for."

With a view to convincing his fellow practitioners that millions of patients are suffering from eye strain, and that they are merely encouraging quacks, by seeking other causes of difficulty Dr. Gould cites "sixty-eight reasons why 'glasses did not give relief.'" Among others relating to a knowledge of refraction in which it appears that oculists and opticians are equally wanting, he states that (6) the oculist may not be morally right-minded in carrying on his work; (7) he may not be intellectually fitted or capable of doing this particular kind of work; (8) he may not be sufficiently painstaking in attention to mathematic accuracy and the slightest details.

We call the attention of the distinguished oculists of the country to these and the remaining 65 reasons, for it may be that they are ignorantly caring for some genius, and it might in the end be written of their patients, as Dr. Gould has done of the famous pair: "Eye strain made George Eliot and Henry Lewes great sufferers, compelled them to waste much of their lives in walking, and killed them at the early age of 61 years."

DISINFECTION AND THE PRESERVATION OF FOOD. By SAMUEL RIDEAL, D.Sc., Lecturer on Chemistry in St. George's Hospital Medical School. John Wiley & Sons, New York.

THIS is an extensive volume of nearly 500 pages, devoted exclusively to the methods of disinfection and preservation of food.

It is of interest in the first place to the large number of manufacturers who put up preserved foods, and it is moreover of vital importance to those who have to deal with the testing of preserved foods.

To army physicians, to the medical man in localities where fresh food is difficult to obtain, such a work is indispensable.

We can recommend it most heartily to sanitarians and practitioners alike. It is largely devoted to technical features and methods, but it will undoubtedly be found useful in the camp, hotel, and field, as well as in the porkpacker's establishment.

A MANUAL OF THE PRACTICE OF MEDICINE. By A. A. STEVENS, A.M., M.D. Sixth edition. Thoroughly revised. W. B. Saunders & Co., Philadelphia, New York and London.

DR. STEVENS' Manual of the Practice of Medicine is so well and favorably known that it needs no commendation of ours. It is really a very marvelous condensation of the absolutely necessary in medicine. It is no wonder that it is in its sixth edition in ten years. In this edition the entire section on diseases of the digestive system has been rewritten as well as individual articles in other parts of the book. Like most of the manuals for students Dr. Stevens' little book of 550 pages may well prove a faithful companion throughout life to the practitioner, who, especially in its flexible cover, can readily carry it with him and find valuable hints and practical suggestions even at the bedside itself. There is many a large text-book of medicine that is not as satisfactory a guide to the practitioner.